ANNALS *of the*

ENTOMOLOGICAL SOCIETY OF AMERICA

Volume 65—1972

Published by the
ENTOMOLOGICAL SOCIETY OF AMERICA

ANNALS OF THE ENTOMOLOGICAL SOCIETY OF AMERICA

WALLACE P. MURDOCH, *Executive Secretary*

RALPH W. BUNN, *Managing Editor* JAMES S. PACKER, *Assistant Managing Editor*

4603 Calvert Road, College Park, Maryland 20740

WILLIAM H. ANDERSON, *Editor*
Route 2, Snow Hill, Maryland 21863

MARSHALL R. WHEELER, *Editor*
University of Texas, Austin 78712

EDITORIAL BOARD

M. H. J. WEIDEN, *Chairman,* South Charleston, W. Va. (B, 1972)

G. W. BYERS, Lawrence, Kans. (A, 1973)
GUY L. BUSH, JR., Austin, Tex. (A, 1974)
ROGER W. WILLIAMS, N. Y., N. Y. (D, 1975)
R. A. MORSE, Ithaca, N. Y. (C, 1976)

A bimonthly journal devoted to basic research in entomology. Contributions should not have economic application or chemical control as their primary objective. Authors are entirely responsible for statements in the ANNALS, whether of fact or opinion.

SUBSCRIPTIONS. Nonmembers in North America and U. S. Possessions—$25.00 per year; elsewhere—$26.00. Single copies—$5.00. Members in North America and U. S. Possessions—$12.50 per year, elsewhere—$13.50. Membership dues: Active $15.00; student $3.00. Deliveries overseas are not guaranteed and foreign mailings are made at the subscriber's risk. Subscribers will be charged a service fee of $1.00 for forwarding journals returned to the ESA because of failure of the subscriber to provide a timely change of address.

MISSING NUMBERS cannot be supplied free of charge in North America and U. S. Possessions unless notice is received within 60 days after the appearance of issues concerned. The Executive Secretary will be glad to quote prices for back numbers.

REPRINTS. A reprint price schedule that applies to orders received before the ANNALS goes to press is shown on the order blank sent with galley proof. No reprints are furnished gratis. For price schedule see BULLETIN OF THE ENTOMOLOGICAL SOCIETY OF AMERICA 18(1): Cover 3, March 1972.

BUSINESS COMMUNICATIONS and matters pertaining to subscriptions and advertisements should be sent to the Executive Secretary. Changes of address must be received 5 days prior to the month of issue to be effective for that month.

MANUSCRIPTS and other copy should be sent to the Executive Secretary. Authors are urged to consult "Publication Policies and Instructions for Contributors" before submitting manuscripts (BULLETIN OF THE ENTOMOLOGICAL SOCIETY OF AMERICA 17(4): 278–81, Dec. 1971). Reproduction of abstracts is authorized. Page charges are $30.00 per page, partial pages proportionately.

ENTOMOLOGICAL SOCIETY OF AMERICA

OFFICERS—1972

President—W. G. Eden, Gainesville, Florida
President-Elect—G. E. Guyer, East Lansing, Michigan
Executive Secretary—W. P. Murdoch, College Park, Maryland

GOVERNING BOARD

W. G. Eden, Gainesville, Florida (1973)
P. L. Adkisson, College Station, Texas (Southwestern, 1973)
G. B. Craig, Jr., Notre Dame, Indiana (D, 1974)
G. E. Guyer, East Lansing, Michigan (F, 1974)
R. H. Harwood, Pullman, Washington (Pacific, 1974)
K. V. Krombein, Washington, D. C. (A, 1972)
L. C. Kuitert, Gainesville, Florida (Southeastern, 1974)
F. L. McEwen, Guelph, Ontario (C, 1973)
W. P. Murdoch, College Park, Maryland (Non-voting)
R. H. Nelson, Lanham, Maryland (Past-President, 1972)
J. V. Osmun, Lafayette, Indiana (North Central, 1972)
L. A. Riehl, Riverside, California (F, 1973)
H. E. Scott, Raleigh, North Carolina (E, 1974)
R. W. Sherman, Silver Spring, Maryland (Eastern, 1973)
C. F. Wilkinson, Ithaca, New York (B, 1972)

BRANCH OFFICERS

President

R. E. Hamman—Ardsley, New York (Eastern)
H. B. Petty, Jr.—Urbana, Illinois (North Central)
H. F. Madsen—Summerland, British Columbia (Pacific)
S. I. Coppock, Jr.—Stillwater, Oklahoma (Southwestern)
C. F. Smith—Raleigh, North Carolina (Southeastern)

President-Elect

J. B. Kring—New Haven, Connecticut (Eastern)
D. L. Goleman—Columbus, Ohio (North Central)
Lauren D. Anderson—Riverside, California (Pacific)
Dieter Enkerlin—Monterrey, N. L., Mexico (Southwestern)
T. R. Pfrimmer—Leland, Mississippi (Southeastern)

Secretary-Treasurers

H. T. Streu—New Brunswick, New Jersey (Eastern)
T. J. Helms—Lincoln, Nebraska (North Central)
R. D. Carter—San Leandro, California (Pacific)
R. O. Drummond—Kerrville, Texas (Southwestern)
J. B. Graves—Baton Rouge, Louisiana (Southeastern)

AUTHOR INDEX TO VOLUME 65

January ..... 1–283 May ..... 521–772 September 993–1244
March ..... 284–520 July ..... 773–992 November 1245–1432

A

Abasa, Ruben O.—Water and Fat Content of Immature and Adult *Sarcophaga tibialis* (Diptera: Sarcophagidae) 396
Abasa, Ruben O.—Reproductive Biology of *Sarcophaga tibialis* (Diptera: Sarcophagidae). II. Morphology of External and Internal Reproductive Organs, Ovary Growth, and Oögenesis 400
Agee, H. R.—Sensory Response of the Compound Eye of Adult *Heliothis zea* and *H. virescens* to Ultraviolet Stimuli 701
Agee, H. R.—Histology of the Compound Eye of *Heliothis virescens* (Lepidoptera: Noctuidae) 767
Akingbohungbe, A. E.—Two Previously Undescribed Species of Miridae in North America (Hemiptera: Heteroptera) 840
AliNiazee, M. Taskeen, and Eugene M. Stafford—Sex Pheromone Studies with Omnivorous Leafroller, *Platynota stultana* (Lepidoptera: Tortricidae): Effect of Various Environmental Factors on Attraction of Males to the Traps Baited with Virgin Females 958
All, J. N., and R. F. Anderson—Initial Attack and Brood Production by Females of *Ips grandicollis* (Coleoptera: Scolytidae) ... 1293
Allen, Douglas C., see John L. Foltz 82
Anderson, Neil H., see Richard C. Fox 513
Anderson, R. F., see J. N. All 1293
Aneshansley, D. J., see T. Eisner 987
Angalet, G. W., see C. E. Rogers 648
Ash, Noreen, see Bernard Greenberg 1340
Ashraf, Mohammad, see John H. Brower .. 950
Ashrafi, Shahid H., John H. Brower, and Elvin W. Tilton—Gamma Radiation Effects on Testes and on Mating Success of the Indian Meal Moth, *Plodia interpunctella* ... 1144
Askari, Ahmad, and Vernon M. Stern—Biology and Feeding Habits of *Orius tristicolor* (Hemiptera: Anthocoridae) 96
Axtell, R. C., see M. G. Karandinos 1092

B

Bacon, Oscar G., see Dennis M. Dunbar .. 892
Bain, N. S., see D. S. Moreno 443, 1061
Balderston, C. P., see W. E. Styer 1089
Ball, H. J., see P. S. Rai 807
Ball, Harold J., see M. F. B. Chaudhury .. 607
Balsbaugh, Edward J., Jr., see Howard Kessler 1333
Barker, Roy J.—Whether the Superiority of Pollen in Diet of Honey Bees is Attributable to Its High Content of Free Proline 270
Barker, Roy J., Kathleen Krebs Ice, Gayle Spratt, and W. F. McCaughey—Proline in Royal Jelly of Honey Bees 1236
Barlow, C. A., see W. H. Siddiqui 993
Barlow, C. A., see J. R. Harrison 1011
Barlow, J. S., see S. N. Thompson 1020
Barry, Dean—Notes on Life History of a Sorghum Shoot Fly, *Atherigona varia soccata* 586
Bath, James E., see George Thottappilly .. 912
Bath, James E., see James H. Tsai 1114
Bawa, S. R., Kuldip C. Kanwar, and Rajinder K. Gupta—Interspecific Hybridization and the Abnormal Strain of *Callosobruchus maculatus* (Coleoptera: Bruchidae) 1241
Baxter, M. C., see N. M. Randolph 1161
Beard, Raimon L.—Effectiveness of Paralyzing Venom and Its Relation to Host Discrimination by Braconid Wasps 90
Beck, Stanley D.—Growth and Retrogression in Larvae of *Trogoderma glabrum* (Coleoptera: Dermestidae). 3. Ecdysis and Form Determination 1319
Behr, Carl T., see Eldon A. Behr 457
Behr, Eldon A., Carl T. Behr, and Louis F. Wilson—Influence of Wood Hardness on Feeding by the Eastern Subterranean Termite, *Reticulitermes flavipes* (Isoptera: Rhinotermitidae) 457
Bell, R. A., see Amador Villacorta 419
Benedict, P. R., and G. T. Fisher—Commensalistic Relationships Between *Plecopteracoluthus downesi* (Diptera: Chironomidae) and *Chauliodes pectinicornis* (Megaloptera: Corydalidae) 109
Benfield, Ernest F.—A Defensive Secretion of *Dineutes discolor* (Coleoptera: Gyrinidae) 1324
Bennett, Stelmon E., see Edward E. Burgess 1331
Benschoter, C. A., and R. T. Wrenn—Germfree Techniques for Establishment and Maintenance of a Colony of Aseptic German Cockroaches 641
Berberet, R. C., and T. J. Helms—Comparative Anatomy and Histology of Selected Systems in Larval and Adult *Phyllophaga anxia* (Coleoptera: Scarabaeidae) 1026

BEROZA, MORTON, see J. D. SOLOMON 1058
BERRY, W. L., M. W. STIMMANN, AND W. W. WOLF—Marking of Native Phytophagous Insects with Rubidium: A Proposed Technique 236
BHAKTHAN, N. M. G., AND K. K. NAIR—Fine Structural Damage in the Somatic Tissues of Gamma-Irradiated House Fly. 1. Flight Muscles 504
BIDLINGMAYER, W. L., see J. D. EDMAN 848
BIESELE, JOHN J., see GEORGE GASSNER, III .. 1302
BITNER, ALBERT R., WILLIAM T. WILSON, AND JOHN D. HITCHCOCK—Passage of *Bacillus larvae* Spores from Adult Queen Honey Bees to Attendant Workers (*Apis mellifera*) 899
BLEVINS, R. D.—Utilization of Cellular DNA and Quantitative Changes in Total Organismal DNA to Determine Cell Numbers During Development of *Aedes aegypti* (Diptera: Culicidae) 829
BLICKENSTAFF, C. C., J. L. HUGGANS, AND R. W. SCHRODER—Biology and Ecology of the Alfalfa Weevil, *Hypera postica*, in Maryland and New Jersey. 1961 to 1967 336
BLICKLE, R. L., see D. G. DENNING 141
BLOCKER, H. DERRICK, T. L. HARVEY, AND J. L. LAUNCHBAUGH—Grassland Leafhoppers. 1. Leafhopper Populations of Upland Seeded Pastures in Kansas 166
BLONDHEIM, S. A., AND A. S. SHULOV—Acoustic Communication and Differences in the Biology of Two Sibling Species of Grasshoppers, *Acrotylus insubricus* and *A. patruelis* 17
BLONDHEIM, SYRIL A., see EVIATAR NEVO ... 980
BLUM, M. S., see K. W. TUCKER 989
BLUM, MURRAY S., AND G. E. BOHART—Neral and Geranial: Identification in a Colletid Bee 274
BLUM, MURRAY S., see SPENCER M. RIEDEL .. 825
BOCH, R., see D. MAUTZ 440
BOHART, G. E., see MURRAY S. BLUM 274
BOLDT, PAUL E., AND C. M. IGNOFFO—Scanning Electron Microscopy of Egg Wounds Inflicted by a *Trichogramma* Wasp 760
BOUDREAUX, H. B., see J. W. SMITH 69
BOUDREAUX, H. BRUCE, see GAIL G. WYNN .. 157
BOWLING, C. C.—Note on the Biology of Rice Water Weevil, *Lissorhoptrus oryzophilus* .. 990
BRADFUTE, O. E., see ROBERT E. WHITMOYER 201
BRADSHAW, WILLIAM E.—Photoperiodic Control of the Initiation of Diapause by *Chaoborus americanus* (Diptera: Culicidae) 755
BRADY, U. EUGENE, AND MILTON C. GANYARD, JR.—Identification of a Sex Pheromone of the Female Beet Armyworm, *Spodoptera exigua* 898
BRADY, U. EUGENE, AND ROBERT C. DALEY—Identification of a Sex Pheromone from the Female Raisin Moth, *Cadra figulilella* 1356
BRADY, U. EUGENE, see G. G. GRANT 1224
BRADY, U. EUGENE, see MILTON C. GANYARD, JR. 1279
BRAND, J. M., see G. G. GRANT 1224
BRANSON, TERRY F., see PAUL L. GUSS 303
BRELAND, OSMOND P., see GEORGE GASSNER, III 1302
BREWER, J. W., see MARK W. HOUSEWEART .. 331
BRINDLEY, T. A., see R. E. LYNCH 433
BRINDLEY, T. A., see G. L. REED 658
BRINDLEY, T. A., see W. B. SHOWERS 450
BROWER, JOHN H.—Interaction of Age and Radiation Dosage on Hatch of *Gibbium psylloides* Eggs (Coleoptera: Ptinidae) 1237
BROWER, JOHN H., AND MOHAMMAD ASHRAF—Histopathology of Irradiated Yellow Mealworm Adult and Larval Midguts 950
BROWER, JOHN H., see SHAHID H. ASHRAFI .. 1144
BRUDER, K. W., AND A. P. GUPTA—Biology of the Pavement Ant, *Tetramorium caespitum* (Hymenoptera: Formicidae) 358
BURGESS, EDWARD E., AND STELMON E. BENNETT—Mortality and Abnormalities Caused by Gamma Irradiation of Alfalfa Weevil Pupae 1331
BURKE, HORACE R.—Observations on the Life History of *Pseudanthonomus krameriae*, with Descriptions of Larva and Pupa (Coleoptera: Curculionidae) 619
BURKE, HORACE R., see DANNY B. GATES 1215
BURKHOLDER, W. E., see JAMES A. COFFELT .. 447
BURKHOLDER, W. E., see K. W. VICK 790
BURTON, R. L., see P. S. JUNEJA 961
BUTLER, LINDA, AND JOGINDER NATH—Post-emergence Changes in Ultrastructure of Flight and Leg Muscle of the Black Carpet Beetle 247

C

CALLAHAN, PHILIP S., AND THELMA C. CARLYSLE—Comparison of the Epaulette and Micronodules on the Tympanic Membrane of the Corn Earworm Moth with Those of the Cabbage Looper 918
CALLAHAN, P. S., see L. J. GOLDMAN 1299
CALLENBACH, J. A., see AMADOR VILLACORTA 419
CALVERT, DONALD J., AND R. VAN DEN BOSCH—Host Range and Specificity of *Monoctonus paulensis* (Hymenoptera: Braconidae) a Parasite of Certain Dactynotine Aphids ... 422
CALVERT, DONALD J., AND R. VAN DEN BOSCH—Behavior and Biology of *Monoctonus paulensis* (Hymenoptera: Braconidae), a Parasite of Dactynotine Aphids 773
CAMORS, F. B., JR., AND THOMAS L. PAYNE—Response of *Heydenia unica* (Hymenoptera: Pteromalidae) to *Dendroctonus frontalis* (Coleoptera: Scolytidae) Pheromones and a Host-Tree Terpene 31
CAMPBELL, FRANK L.—A New Antennal Sensillum of *Blattella germanica* (Dictyoptera: Blattellidae) and Its Presence in Other Blattaria 888
CARLYSLE, T. C., see L. J. GOLDMAN 1299
CARLYSLE, THELMA C., see PHILIP S. CALLAHAN 918
CARMAN, G. E., see D. S. MORENO 443, 1061
CARREL, J. C., see T. EISNER 765
CARTER, FAIRIE LYN, LINDA A. DINUS, AND RICHARD V. SMYTHE—Fatty Acids of the Eastern Subterranean Termite, *Reticulitermes flavipes* (Isoptera: Rhinotermitidae) 655
CARTER, FAIRIE LYN, AND RICHARD V. SMYTHE—Extractives of Baldcypress, Black Walnut, and Redwood and Survival of the Eastern Subterranean Termite, *Reticulitermes flavipes* 686

CARTER, FAIRIE LYN, CHARLES A. STRINGER, AND RICHARD V. SMYTHE—Survival of Six Colonies of *Reticulitermes flavipes* on Unfavorable Woods 984
CARTER, S. W., see W. D. GUTHRIE 108
CHABORA, P. C.—Studies in Parasite-Host Interaction. IV. Modification of Parasite, *Nasonia vitripennis,* Responses to Control and Selected Host, *Musca domestica,* Populations 323
CHAMBERLAIN, W. F., see D. E. HOPKINS .771, 1182
CHAPMAN, J. A.—Ommatidia Numbers and Eyes in Scolytid Beetles 550
CHAPMAN, R. KEITH, see C. J. ECKENRODE ... 151
CHASE, J. A., AND F. R. GILLILAND, JR.—Testicular Development in the Tobacco Budworm 901
CHAUDHURY, M. F. B., HAROLD J. BALL, AND C. M. JONES—A Sex Pheromone of the Female Face Fly, *Musca autumnalis,* and Its Role in Sexual Behavior 607
CHEW, ROBERT M., see ROBERT S. TOTH 1270
CHIPPENDALE, G. M., AND A. S. REDDY—Diapause of the Southwestern Corn Borer, *Diatraea grandiosella:* Transition from Spotted to Immaculate Mature Larvae 882
CHOW, YIEN-SHING, AND SHENG-HWA LIN—The Musculature and Neuromuscular Potential in Tarsus I of the Gulf Coast Tick, *Amblyomma maculatum* (Acarina: Ixodidae) 61
CHOW, YIEN-SHING, see SHENG-HWA LIN ... 296
CHRISTENSEN, HOWARD A.—Colonization of *Lutzomyia trinidadensis* and *L. vespertilionis* (Diptera: Psychodidae) 683
CHRISTENSEN, J. B., see W. R. COTHRAN 769
CLAY, MARY ELLEN, AND CARL E. VENARD—The Fine Structure of the Oesophageal Diverticula in the Mosquito *Aedes triseriatus* ... 964
CLAY, THERESA, see ROGER D. PRICE 487
CLIFFORD, CARLETON M., see ELEANOR K. JONES 730
COAN, MICHAEL E., see ROBERT F. WHITCOMB 797
COFFELT, JAMES A., AND W. E. BURKHOLDER—Reproductive Biology of the Cigarette Beetle, *Lasioderma serricorne.* 1. Quantitative Laboratory Bioassay of the Female Sex Pheromone from Females of Different Ages 447
COLLINS, HOMER L., see GEORGE P. MARKIN .. 1053
CONE, WYATT W., see DAVID R. PENMAN 1289
COOLEY, TIM A., see THOMAS H. WILSON ... 414
COPPEL, H. C., see J. W. MERTINS 33, 1424
COPPEL, HARRY C., see DOUGLAS A. VALEK .. 310
COSGROVE, G. E., see JERRY A. PAYNE 74
COSTER, JACK E., AND J. P. VITÉ—Effects of Feeding and Mating on Pheromone Release in the Southern Pine Beetle 263
COTHRAN, W. R., J. B. CHRISTENSEN, AND C. G. SUMMERS—Fall Movement Patterns of the Egyptian Alfalfa Weevil, *Hypera brunneipennis,* in 1970 769
CRAIG, GEORGE B., JR., see C. E. MACHADO-ALLISON 542
CROWDER, LARRY A., AND D. L. SHANKLAND—Structure of the Malpighian Tubule Muscle of the American Cockroach, *Periplaneta americana* 614

D

DAKSHAYANI, K., see S. B. MATHAD 282
DALEY, ROBERT C., see U. EUGENE BRADY ... 1356
DATERMAN, G. E.—Laboratory Bioassay for Sex Pheromone of the European Pine Shoot Moth, *Rhyacionia buoliana* 119
DEAN, H. A., AND W. G. HART—*Saisettia miranda* (Homoptera: Coccidae), a Potential Pest of Citrus in Texas 478
DEGRUGILLIER, MAURICE E., AND ROGER A. LEOPOLD—Abdominal Peripheral Nervous System of the Adult Female House Fly and Its Role in Mating Behavior and Insemination 689
DELOACH, C. J., AND R. L. RABB—Seasonal Abundance and Natural Mortality of *Winthemia manducae* (Diptera: Tachinidae) and Degree of Parasitization of Its Host, the Tobacco Hornworm 779
DELOACH, C. J., see J. V. RICHERSON 834
DENLINGER, DAVID L.—Seasonal Phenology of Diapause in the Flesh Fly *Sarcophaga bullata* 410
DENNING, D. G., AND R. L. BLICKLE—A Review of the Genus *Ochrotrichia* (Trichoptera: Hydroptilidae) 141
DENTON, ROBERT E., see JOHN R. THORNBURY 1232
DEONIER, D. L.—A Floating Adhesive Trap for Neustonic Insects 269
DEWEY, JERALD E.—A Pine Looper, *Phaeoura mexicanaria* (Lepidoptera: Geometridae), in Southeastern Montana with Notes on Its Biology 306
DICKE, ROBERT J., see CORINNE M. THOMAS 1069
DILLIER, JUSTIN H., see GEORGE P. MARKIN .. 1053
DINUS, LINDA A., see FAIRIE LYN CARTER ... 655
DOOLITTLE, R. E., see J. D. SOLOMON 1058
DOUGLAS, GEORGE W., see PAUL L. RICE 514
DOW, MARK I., AND WILLIS W. WIRTH—Studies on the Genus *Forcipomyia.* 2. The Nearctic Species of the Subgenera *Thyridomyia* and *Synthyridomyia* (Diptera: Ceratopogonidae) 177
DOW, MARK I., see WILLIS W. WIRTH 862
DOW, R. P., see J. D. EDMAN 848
DUNBAR, D. M., R. M. WESELOH, AND G. S. WALTON—A Fungus Observed on Egg Clusters of the Gypsy Moth, *Porthetria dispar* (Lepidoptera: Lymantriidae) 1419
DUNBAR, DENNIS M.—Notes on the Mating Behavior of *Geocoris punctipes* (Hemiptera: Lygaeidae) 764
DUNBAR, DENNIS M., AND OSCAR G. BACON—Feeding, Development, and Reproduction of *Geocoris punctipes* (Heteroptera: Lygaeidae) on Eight Diets 892
DUNKLE, R. L., AND F. E. STRONG—A Digital Electrolytic Microrespirometer 705
DUPRAZ, BETTY J., see VERNON M. KIRK 513

E

EATON, JUDY, see HOLLIS M. FLINT 942
EBEL, BERNARD H., see HARRY O. YATES, III 100
ECKENRODE, C. J., AND R. KEITH CHAPMAN—Seasonal Adult Cabbage Maggot Populations in the Field in Relation to Thermal-Unit Accumulations 151

EDMAN, J. D., J. S. HAEGER, W. L. BIDLINGMAYER, R. P. DOW, J. K. NAYAR, AND M. W. PROVOST—Sexual Behavior of Mosquitoes. 4. Field Observations on Mating and Insemination of Marked Broods of *Aedes taeniorhynchus* 848
EDMAN, JOHN D., AND ARDEN O. LEA—Sexual Behavior of Mosquitoes. 2. Large-Scale Rearing and Marking of *Culex* for Field Experiments 267
EDMAN, JOHN D., see ARDEN O. LEA 290
EDMUNDS, GEORGE F., JR., see WILLIAM L. PETERS 1398
EIKENBARY, R. D., see C. E. ROGERS 38, 648
EIKENBARY, R. D., see K. J. STARKS 650
EISNER, T., P. JUTRO, D. J. ANESHANSLEY, AND RUSSEL NIEDHAUK—Defense Against Ants in a Caterpillar That Feeds on Ant-Guarded Scale Insects 987
ELSEY, KENT D.—Defenses of Eggs of *Manduca sexta* Against Predation by *Jalysus spinosus* 896
ERICKSON, JAMES M.—Mark-Recapture Techniques for Population Estimates of *Pogonomyrmex* Ant Colonies: An Evaluation of the ^{32}P Technique 57
EISNER, T., A. F. KLUGE, J. C. CARREL, AND J. MEINWALD—Defense Mechanisms of Arthropods. XXXIV. Formic Acid and Acyclic Ketones in the Spray of a Caterpillar 765
EVANS, D. G., see ARDEN O. LEA 285

F

FARISH, D. J.—An Inexpensive Keyboard for Continuous Recording of Insect Behavior .. 278
FARISH, D. J.—Balanced Polymorphism in North American Populations of the Meadow Spittlebug, *Philaenus spumarius* (Homoptera: Cercopidae). 1. North American Morphs 710
FATZINGER, CARL W.—Bioassay, Morphology, and Histology of the Female Sex Pheromone Gland of *Dioryctria abietella* (Lepidoptera: Pyralidae (Phycitinae)) 1208
FINN, WARREN E., VICTOR C. MASTRO, AND THOMAS L. PAYNE—Stridulatory Apparatus and Analysis of the Acoustics of Four Species of the Subfamily Lamiinae (Coleoptera: Cerambycidae) 644
FISHER, G. T., see P. R. BENEDICT 109
FITZGERALD, T. D., AND W. P. NAGEL—Oviposition and Larval Bark-Surface Orientation of *Medetera aldrichii* (Diptera: Dolichopodidae): Response to a Prey-Liberated Plant Terpene 328
FLAHERTY, B. R., see P. T. M. LUM 976
FLANDERS, S. E.—The Duality of Imaginal Diapause Inception in Pteromalids Parasitic on *Hypera postica* 105
FLINT, HOLLIS M., AND IAN C. MCDONALD—Genetic Loads in Two House Fly Populations Treated with Substerilizing Doses of X-Rays for Thirty-Two Generations 594
FLINT, HOLLIS M., JUDY EATON, AND WALDEMAR KLASSEN—The Use of Fumidil-B to Reduce Microsporidian Disease in Colonies of the Boll Weevil 942
FLORENTINE, GERARD J., see JOHN G. HOLSAPPLE 1388
FOARD, DON, see JERRY A. PAYNE 74
FOLTZ, JOHN L., FRED B. KNIGHT, AND DOUGLAS C. ALLEN—Numerical Analysis of Population Fluctuations of the Jack Pine Budworm 82
FOSTER, J. E., AND R. L. GALLUN—Populations of the Eastern Races of the Hessian Fly Controlled by Release of the Dominant Avirulent Great Plains Race 750
FOWLER, DONA J., CLARENCE J. GOODNIGHT, AND MARY M. LABRIE—Circadian Rhythms of 5-Hydroxytryptamine (Serotonin) Production in Larvae, Pupae, and Adults of *Drosophila melanogaster* (Diptera: Drosophilidae) 138
FOWLER, HARLAND W., JR.—Rates of Insemination by Induced Copulation of *Aedes vexans* (Diptera: Culicidae) Treated with Three Anesthetics 293
FOX, P. M., see RICHARD THURSTON 547
FOX, RICHARD C., NEIL H. ANDERSON, SUSAN C. GARNER, AND ALTON I. WALKER—Larval Head Capsules of the Nantucket Pine Tip Moth 513
FOX, RICHARD C., see THOMAS M. HILL 269
FRENCH, JOHN R. J., AND RICHARD A. ROEPER—Observations of *Trypodendron rufitarsis* (Coleoptera: Scolytidae) and Its Primary Symbiotic Fungus, *Ambrosiella ferruginea* .. 282
FRENCH, JOHN R. J., AND RICHARD A. ROEPER—In Vitro Culture of the Ambrosia Beetle *Xyleborus dispar* (Coleoptera: Scolytidae) with Its Symbiotic Fungus, *Ambrosiella hartigii* 719
FRICK, KENNETH E.—Third List of Insects that Feed upon Tansy Ragwort, *Senecio jacobaea*, in the Western United States ... 629
FRICK, KENNETH E., AND GERALD R. JOHNSON—*Longitarsus jacobaeae* (Coleoptera: Chrysomelidae), a Flea Beetle for the Biological Control of Tansy Ragwort. 3. Comparison of the Biologies of the Egg Stage of Swiss and Italian Biotypes 406
FURNISS, M. M., L. N. KLINE, R. F. SCHMITZ, AND J. A. RUDINSKY—Tests of Three Pheromones to Induce or Disrupt Aggregation of Douglas-Fir Beetles (Coleoptera: Scolytidae) on Live Trees 1227

G

GALLUN, R. L., see J. E. FOSTER 750
GALFORD, JIMMY R., see BRUCE H. KENNEDY 757
GANGRADE, G. A., see K. N. KAPOOR 755
GANYARD, MILTON C., JR., AND U. EUGENE BRADY—Interspecific Attraction in Lepidoptera in the Field 1279
GANYARD, MILTON C., JR., see U. EUGENE BRADY 898
GAPASIN, DELY P., AND KE CHUNG KIM—Taxonomic Notes on Five Common Holarctic Species of *Leptocera* (Diptera: Sphaeroceridae) 1245
GARA, R. I., see DAVID OVERHULSER 1423
GARNER, SUSAN C., see RICHARD C. FOX 513

GASSNER, GEORGE, III, OSMOND P. BRELAND, AND JOHN J. BIESELE—The Spermatozoa of the Scorpionfly *Panorpa nuptialis:* A Transmission Electron Microscope Study 1302
GASTON, LYLE K., see L. L. SOWER 954
GATES, DANNY B., AND HORACE R. BURKE—Review of the Gall-Inhabiting Weevils of the Genus *Anthonomus,* with Description and Biology of a New Species (Coleoptera: Curculionidae) 1215
GEORGHIOU, G. P., see J. W. SMITH, JR. 221
GHOLSON, R. K., see P. S. JUNEJA 961
GILLIAM, MARTHA, AND KAREN K. JACKSON—Proteins of Developing Worker Honey Bees, *Apis mellifera* 516
GILLILAND, F. R., JR., see J. A. CHASE 901
GOLDMAN, L. J., P. S. CALLAHAN, AND T. C. CARLYSLE—Tibial Combs and Proboscis Cleaning in Mosquitoes 1299
GOODNIGHT, CLARENCE J., see DONA J. FOWLER 138
GOTWALD, WILLIAM H., JR., AND JEAN LÉVIEUX—Taxonomy and Biology of a New West African Ant Belonging to the Genus *Amblyopone* (Hymenoptera: Formicidae) .. 383
GOUGER, R. J., see W. C. YEARIAN 481
GRAHAM, O. H., see W. H. NEWTON ... 508, 536
GRANETT, J., AND N. C. LEELING—A Hyperglycemic Agent in the Serum of DDT-Prostrate American Cockroaches, *Periplaneta americana* 299
GRANT, G. G., U. EUGENE BRADY, AND J. M. BRAND—Male Armyworm Scent Brush Secretion: Identification and Electroantennogram Study of Major Components 1224
GREANY, PATRICK D., AND EARL R. OATMAN—Demonstration of Host Discrimination in the Parasite *Orgilus lepidus* (Hymenoptera: Braconidae) 375
GREANY, PATRICK D., AND EARL R. OATMAN—Analysis of Host Discrimination in the Parasite *Orgilus lepidus* (Hymenoptera: Braconidae) 377
GREANY, PATRICK, D., AND EARL R. OATMAN—Oviposition by an Isolated Parasite Abdomen 991
GREENBERG, BERNARD, AND NOREEN ASH—Setiferous Plaques on Antennal Pedicels of Muscoid Diptera: Appearance in Various Species and Tests of Function 1340
GRIMBLE, DAVID G., see JOHN C. NORD ... 114, 127
GUELDNER, R. C., see R. D. HENSON 981
GUJRATI, J. P., see K. N. KAPOOR 755
GUPTA, A. P., see K. W. BRUDER 358
GUPTA, RAJINDER K., see S. R. BAWA 1241
GURNEY, ASHLEY, B., AND LOUIS M. ROTH—A Generic Review of the Cockroaches of the Subfamily Panchlorinae (Dictyoptera, Blattaria, Blaberidae) 521
GURNEY, ASHLEY B., see THOMAS J. WALKER 460
GUSS, PAUL L., AND TERRY F. BRANSON—The Use of ^{75}Se in Feeding Studies with the Corn Leaf Aphid (Hemiptera (Homoptera) Aphididae) 303
GUTHRIE, W. D., AND S. W. CARTER—Backcrossing to Increase Survival of Larvae of a Laboratory Culture of the European Corn Borer in Field Corn 108

H

HAEGER, J. S., see J. D. EDMAN 848
HAIR, JAKIE A., see JOHN R. SAUER 1065
HALBERG, F., see D. K. HAYES 93
HAMILTON, K. G. ANDREW, see HERBERT H. ROSS 929
HARMAN, AMY L., see DAN M. HARMAN 1076
HARMAN, DAN M., AND AMY L. HARMAN—Stridulatory Mechanisms in the White Pine Weevil, *Pissodes strobi* 1076
HARRISON, J. R., AND C. A. BARLOW—Population-Growth of the Pea Aphid, *Acyrthosiphon pisum* (Homoptera: Aphididae) After Exposure to Extreme Temperatures 1011
HART, W. G., see H. A. DEAN 478
HARVEY, T. L., see H. DERRICK BLOCKER 166
HASKINS, J. R., see B. R. NORMENT 1149
HAY, C. JOHN—Red Oak Borer (Coleoptera: Cerambycidae) Emergence from Oak in Ohio 1243
HAY, C. JOHN—Woodpecker Predation on Red Oak Borer in Black, Scarlet, and Northern Red Oak 1421
HAYES, D. K., J. HORTON, M. S. SCHECHTER, AND F. HALBERG—Rhythm of Oxygen Uptake in Diapausing Larvae of the Codling Moth at Several Temperatures 93
HEDIN, P. A., see R. D. HENSON ....., 981
HEINRICHS, E. A., see ELLIS L. MATHENY, JR. 238
HELMS, T. J., see CHRISTIAN Y. OSETO 622
HELMS, T. J., see R. C. BERBERET 1026
HENRY, J. E., see JANET L. MOORE 1286
HENSON, R. D., A. C. THOMPSON, R. C. GUELDNER, AND P. A. HEDIN—Constituents of the Boll Weevil. VII. The Molting Hormone: Isolation Studies 981
HEPNER, L. W., see B. R. NORMENT 1149
HILL, THOMAS M., AND RICHARD C. FOX—Two Pine Seedling Weevils Attracted to Pines Infested by the Black Turpentine Beetle ... 269
HITCHCOCK, JOHN D., see ALBERT R. BITNER .. 899
HODSON, A. C.—Distribution and Abundance of the Northern Walkingstick, *Diapheromera femorata* 876
HODSON, A. C., see J. A. WITTER 25
HOGAN, G. RICHARD—Development of *Tribolium castaneum* (Coleoptera: Tenebrionidae) in Media Supplemented with Pyrimidines and Purines 631
HOLSAPPLE, JOHN G., AND GERARD J. FLORENTINE—Thermal Perception by the Red Flour Beetle, *Tribolium castaneum* 1388
HOOPER, RUTH L., C. W. PITTS, AND JANE A. WESTFALL—Sense Organs on the Ovipositor of the Face Fly, *Musca autumnalis* 577
HOPKINS, D. E., AND W. F. CHAMBERLAIN—In Vitro Colonization of the Cattle Biting Louse, *Bovicola bovis* 771
HOPKINS, D. E., AND W. F. CHAMBERLAIN—Sheep Biting Louse: Notes on the Biology of Lice Reared Off the Host 1182
HORNER, NORMAN V., AND KENNETH J. STARKS—Bionomics of the Jumping Spider *Metaphidippus galathea* 602
HORSFALL, WILLIAM R., AND FRANK RAY VOORHEES—Eggs of Floodwater Mosquitoes XIV. Northern *Aedes* (Diptera: Culicidae) 123

HORTON, J., see D. K. HAYES 93
HOUSEWEART, MARK W., AND J. W. BREWER—Biology of a Pinyon Spindle Gall Midge (Diptera: Cecidomyiidae) 331
HOWE, W. L., EVA ZDARKOVA, AND A. M. RHODES—Host Preferences of *Acalymma vittatum* (Coleoptera: Chrysomelidae) Among Certain Cucurbitaceae 372
HOWELL, JAMES O.—A New Species of *Aclerda* from Spanish Moss in Georgia (Homoptera: Coccoidea: Aclerdidae) 1261
HOXIE, ROBERT P., see STANLEY G. WELLSO .. 558
HUGGANS, J. L., see C. C. BLICKENSTAFF 336
HUNG, A. CHANG-FU, HIROTAMI T. IMAI, AND MASAO KUBOTA—The Chromosomes of Nine Ant Species (Hymenoptera: Formicidae) from Taiwan, Republic of China 1023
HUSBAND, R. W.—A New Genus and Species of Mite (Acarina: Podapolipidae) Associated with the Coccinellid *Cycloneda sanguinea* 1099

I

ICE, KATHLEEN KREBS, see ROY J. BARKER .. 1236
IGBOKWE, E. C., see JAMES H. TSAI 1114
IGNOFFO, C. M., see PAUL E. BOLDT 760
ILCKEN, E. H., see J. B. KREASKY 1431
IMAI, HIROTAMI T., see A. CHANG-FU HUNG. 1023

J

JACKSON, H. B., see C. E. ROGERS 38, 648
JACKSON, KAREN K., see MARTHA GILLIAM 516
JOHNSEY, R., see DAVID OVERHULSER 1423
JOHNSON, GERALD R., see KENNETH E. FRICK. 406
JONES, C. M., see M. F. B. CHAUDHURY 607
JONES, ELEANOR K., AND CARLETON M. CLIFFORD — The Systematics of the Subfamily Ornithodorinae (Acarina: Argasidae). V. A Revised Key to Larval Argasidae of the Western Hemisphere and Description of Seven New Species of *Ornithodoros* 730
JONES, RICHARD L., W. W. MCMILLIAN, AND B. R. WISEMAN—Chemicals in Kernels of Corn That Elicit a Feeding Response from Larvae of the Corn Earworm 821
JONES, RICHARD L., see W. J. LEWIS 1087
JUNEJA, P. S., R. K. GHOLSON, R. L. BURTON, AND K. J. STARKS—The Chemical Basis for Greenbug Resistance in Small Grains. 1. Benzyl Alcohol as a Possible Resistance Factor 961
JUTRO, P., see T. EISNER 987

K

KAAE, R. S., AND H. H. SHOREY—Sex Pheromones of Noctuid Moths. XXVII. Influence of Wind Velocity on Sex Pheromone Releasing Behavior of *Trichoplusia ni* Females ... 436
KAMBUROV, STEPHAN S.—Artificial Infestation of Citrus Fruits with the Mediterranean Fruit Fly 1238
KAMM, J. A., AND P. O. RITCHER—Rapid Dissection of Insects to Determine Ovarial Development 271
KANWAR, KULDIP C., see S. R. BAWA 1241
KAPOOR, K. N., J. P. GUJRATI, AND G. A. GANGRADE — Parasites of *Oberea brevis* (Coleoptera: Lamiidae) 755
KARANDINOS, M. G., AND R. C. AXTELL—Age-Related Changes in the Fertility of *Hippelates pusio, H. bishoppi,* and *H. pallipes* (Diptera: Chloropidae) 1092
KARDATZKE, JAMES T., AND KHIAN K. LIEM—Growth of *Aedes stimulans* and *A. vexans* (Diptera: Culicidae) in Saline Solutions ... 1425
KEARNS, D. R., AND K. K. NAIR—Physiological Studies on Effects of Tepa on *Schistocerca gregaria* 216
KEIFER, H. H., AND J. L. SAUNDERS—*Trisetacus campnodus,* n. sp. (Acarina: Eriophyidae) Attacking *Pinus sylvestris* 46
KENNEDY, BRUCE H., AND JIMMY R. GALFORD—Development of *Dendrosoter protuberans* (Hymenoptera: Braconidae) on Larvae of the Smaller European Elm Bark Beetle Being Reared on an Artificial Medium 757
KESSLER, HOWARD, AND EDWARD U. BALSBAUGH, JR.—Succession of Adult Coleoptera in Bovine Manure in East Central South Dakota 1333
KHALIL, GALILA M.—Biochemical and Physiological Studies of Certain Ticks (Ixodoidea). Incorporation of Tritiated Tyrosine in the Salivary Glands of Nymphal *Argas (Persicargas) arboreus* 746
KIM, KE CHUNG, see DELY P. GAPASIN 1245
KIRK, VERNON M.—Identification of Ground Beetle Larvae Found in Cropland in South Dakota 1349
KIRK, VERNON M.—Seed-Caching by Larvae of Two Ground Beetles, *Harpalus pensylvanicus* and *H. erraticus* 1426
KIRK, VERNON M., AND BETTY J. DUPRAZ—Discharge by a Female Ground Beetle, *Pterostichus lucublandus* (Coleoptera: Carabidae), Used as a Defense Against Males .. 513
KITZMILLER, J. B., see S. NARANG 798
KLASSEN, WALDEMAR, see HOLLIS M. FLINT .. 942
KLINE, L. N., see M. M. FURNISS 1227
KLUGE, A. F., see T. EISNER 765
KLUN, JEROME A., AND JOHN F. ROBINSON—Olfactory Discrimination in the European Corn Borer and Several Pheromonally Analogous Moths 1337
KNIGHT, FRED B., see JOHN L. FOLTZ 82
KNIGHT, FRED B., see JOHN C. NORD 114, 127
KOGAN, MARCOS—Fluorescence Photography in the Quantitative Evaluation of Feeding by Phytophagous Insects 277
KOGAN, MARCOS—Feeding and Nutrition of Insects Associated with Soybeans. 2. Soybean Resistance and Host Preferences of the Mexican Bean Beetle, *Epilachna varivestis* 675
KOK, LOKE TUCK, AND DALE M. NORRIS—Symbiontic Interrelationships Between Microbes and Ambrosia Beetles. VI. Amino Acid Composition of Ectosymbiotic Fungi of *Xyleborus ferrugineus* 598
KRAMER, JAMES P., see ROBERT F. WHITCOMB 797

KREASKY, J. B., E. H. ILCKEN, AND WM. M. ROGOFF—Insects Collected by Airplane Over the Imperial Valley, California 1431
KRYSAN, JAMES L.—Embryonic Stage of *Diabrotica virgifera* (Coleoptera: Chrysomelidae) at Diapause 768
KRYSAN, JAMES L., AND DORIS A. RODEN—Frozen Section Methods for Enzyme Histochemistry of Insect Eggs 519
KUBOTA, MASAO, see A. CHANG-FU HUNG ... 1023
KULMAN, H. M., see J. A. WITTER 25

L

LABRIE, MARY M., see DONA J. FOWLER 138
LAUNCHBAUGH, J. L., see H. DERRICK BLOCKER 166
LEA, ARDEN O., AND D. G. EVANS—Sexual Behavior of Mosquitoes. 1. Age Dependence of Copulation and Insemination in the *Culex pipiens* Complex and *Aedes taeniorhynchus* in the Laboratory 285
LEA, ARDEN O., AND JOHN D. EDMAN—Sexual Behavior of Mosquitoes. 3. Age Dependence of Insemination of *Culex nigripalpus* and *C. pipiens quinquefasciatus* in Nature 290
LEA, ARDEN O., see JOHN D. EDMAN 267
LECATO, G. LEONARD, III, AND R. L. PIENKOWSKI—Fecundity, Egg Fertility, Duration of Oviposition, and Longevity of Alfalfa Weevils from Eight Mating and Storage Conditions 319
LECATO, G. LEONARD, III, AND R. L. PIENKOWSKI — Alfalfa Weevil Oviposition: Influence of Sperm Stored in the Spermatheca 979
LEE, CHUNG, see STANLEY G. WELLSO 558
LEELING, N. C., see J. GRANETT 299
LEGNER, E. F.—Observations on Hybridization and Heterosis in Parasitoids of Synanthropic Flies 254
LEOPOLD, ROGER A., see MAURICE E. DEGRUGILLIER 689
LEPPLA, NORMAN C.—Calling Behavior During Pheromone Release in the Female Pink Bollworm Moth 281
LÉVIEUX, JEAN, see WILLIAM H. GOTWALD, JR. 383
LEVY, GERALD F., see DANIEL E. SONENSHINE 1175
LEWIS, L. C., see R. E. LYNCH 433
LEWIS, STANDLEY E.—Two New Species of Fossil Robber Flies (Diptera: Asilidae) from the Ruby River Basin (Oligocene) of Southwestern Montana 275
LEWIS, STANDLEY E.—Fossil Caddisfly (Trichoptera) Cases from the Ruby River Basin (Oligocene) of Southwestern Montana 518
LEWIS, STANDLEY E.—A New Species of Fossil Bee Fly (Diptera: Bombyliidae) from the Ruby River Basin (Oligocene) of Southwestern Montana 1421
LEWIS, W. J., RICHARD L. JONES, AND A. N. SPARKS—A Host-Seeking Stimulant for the Egg Parasite *Trichogramma evanescens:* Its Source and a Demonstration of Its Laboratory and Field Activity 1087
LIEM, KHIAN K., see JAMES T. KARDATZKE .. 1425
LIEUX, MEREDITH, see B. H. WILSON 1264
LIN, SHENG-HWA, see YIEN-SHING CHOW .. 61
LIN, SHENG-HWA, AND YIEN-SHING CHOW—Sense Organs of the Antennae of the Cabbage Looper, *Trichoplusia ni* (Lepidoptera: Noctuidae) 296
LOUGHNER, G. E. — Mating Behavior of the European Corn Borer, *Ostrinia nubilalis,* as Influenced by Photoperiod and Thermoperiod 1016
LOWRIE, D. C., see V. SEVACHERIAN 111
LUM, P. T. M., AND B. R. FLAHERTY—Effect of Carbon Dioxide on Production and Hatchability of Eggs of *Plodia interpunctella* (Lepidoptera: Phycitidae) 976
LYNCH, R. E., T. A. BRINDLEY, AND L. C. LEWIS—Influence of Photophase and Temperature on Survival and Oxygen Consumption of Diapausing European Corn Borers .. 433

M

MACHADO-ALLISON, C. E., AND GEORGE B. CRAIG, JR.—Geographic Variation in Resistance to Desiccation in *Aedes aegypti* and *A. atropalpus* (Diptera: Culicidae) 542
MANGUM, CHARLES L., see WILLIAM C. NETTLES, JR. 554
MARKIN, GEORGE P., HOMER L. COLLINS, AND JUSTIN H. DILLIER — Colony Founding by Queens of the Red Imported Fire Ant, *Solenopsis invicta* 1053
MARKS, LOUIS S., see DONALD J. PROCACCINI 1346
MASTRO, VICTOR C., see WARREN E. FINN .. 644
MATHAD, S. B., AND K. DAKSHAYANI—Laboratory Rearing of the Cricket *Plebeiogryllus guttiventris* 282
MATHAD, S. B., see Y. F. NEELGUND 763
MATHENY, ELLIS L., JR., AND E. A. HEINRICHS—Chorion Characteristics of Sod Webworm Eggs 238
MAULDIN, JOE K., see RICHARD V. SMYTHE .. 1001
MAUTZ, D., R. BOCH, AND R. A. MORSE—Queen Finding by Swarming Honey Bees .. 440
MAYO, Z. B., JR., AND K. J. STARKS—Sexuality of the Greenbug, *Schizaphis graminum,* in Oklahoma 671
MAYO, Z. B., JR., AND K. J. STARKS—Chromosome Comparisons of Biotypes of *Schizaphis graminum* to One Another and to *Rhopalosiphum maidis, R. padi,* and *Sipha flava* 925
MACFARLANE, JOHN—Apparatus for Recording Electromyograms from Tethered Flying Moths 982
MCCAUGHEY, W. F., see ROY J. BARKER 1236
MCCULLOUGH, BRO. THOMAS, C.S.C.—Defensive Chemistry of the Ground Beetle *Callisthenes luxatus* (Coleoptera: Carabidae) .. 275
MCCULLOUGH, THOMAS—Analysis of the Defensive Scent Fluid of *Pasimachus elongatus* (Coleoptera: Carabidae) 772
MCDONALD, IAN C., see HOLLIS M. FLINT ... 594

McIver, Susan B.—Fine Structure of the Sensilla Chaetica on the Antennae of *Aedes aegypti* (Diptera: Culicidae) 1390
McMillian, W. W., see Richard L. Jones .. 821
McPherson, J. E.—Life History of *Corimelaena lateralis lateralis* (Hemiptera: Thyreocoridae) with Descriptions of Immature Stages and List of Other Species of Scutelleroidea Found with It on Wild Carrot 906
McPherson, J. E.—Laboratory Rearing of *Trichopepla semivittata* (Hemiptera: Pentatomidae) on Wild Carrot 985
McPherson, J. E., see J. F. Walt 1242
Medley, R. D., see R. B. Ryan 172
Meinwald, J., see T. Eisner 765
Mertins, J. W., and H. C. Coppel—Previously Undescribed Abdominal Glands in the Female Introduced Pine Sawfly, *Diprion similis* (Hymenoptera: Diprionidae) 33
Mertins, J. W., and H. C. Coppel—Seed Dockage Sieves for Sex-Separation of Pine Sawfly Cocoons 1424
Miller, G. L., see D. L. Silhacek 1084
Miller, M. C.—Scanning Electron Microscope Studies of the Flagellar Sense Receptors of *Peridesmia discus* and *Nasonia vitripennis* (Hymenoptera: Pteromalidae) 1119
Mitlin, Norman, and Glenn Wiygul—Contribution of Pyrimidines to the Biosynthesis of Fecal Uric Acid in Normal and Busulfan-Treated Boll Weevils 612
Mockford, Edward L.—*Anomopsocus* and *Antipsocus:* Synonymy, Species, and Taxonomic Position (Psocoptera: Lachesillidae) . 1359
Moore, C. G., and D. M. Whitacre—Competition in Mosquitoes. 2. Production of *Aedes aegypti* Larval Growth Retardant at Various Densities and Nutrition Levels 915
Moore, Janet L., J. E. Henry, and H. W. Smith—Inclusions in the Fat Body of the Alfalfa Leafcutter Bee, *Megachile rotundata* 1286
Moreno, D. S., G. E. Carman, R. E. Rice, J. G. Shaw, and N. S. Bain—Demonstration of a Sex Pheromone of the Yellow Scale, *Aonidiella citrina* 443
Moreno, D. S., G. E. Carman, and N. S. Bain—Extraction and Bioassay of, and Effect of Solvents on, the Sex Pheromone of the Yellow Scale 1061
Moreno, Daniel S.—Location of the Site of Production of the Sex Pheromone in the Yellow Scale and the California Red Scale 1283
Morse, R. A., see D. Mautz 440
Morse, Roger A.—Honey Bee Alarm Pheromone: Another Function 1430
Moyer, Maxine W., see Douglas L. Parker 1415
Mulkern, Gregory B., and Donald R. Toczek—Effect of Plant Extracts on Survival and Development of *Melanoplus differentialis* and *M. sanguinipes* (Orthoptera: Acrididae) 662
Mulkern, Gregory B., see Roger E. Sandquist 1005
Muniappan, R., see K. J. Starks 650
Myser, Willard C., see John R. Tripp 1310

N

Nagel, W. P., see T. D. Fitzgerald 328
Nair, K. K., see D. R. Kearns 216
Nair, K. K., see N. M. G. Bhakthan 504
Narang, S., and J. B. Kitzmiller—Dehydrogenase Polymorphism in *Anopheles punctipennis* (Diptera: Culicidae). Genetics of Xanthine and Octanol Dehydrogenases 798
Nath, Joginder, see Linda Butler 247
Nation, James L.—Courtship Behavior and Evidence for a Sex Attractant in the Male Caribbean Fruit Fly, *Anastrepha suspensa* .. 1364
Nault, L. R., see Robert E. Whitmoyer 201
Nayar, J. K., see J. D. Edman 848
Neel, W. W., see J. D. Solomon 1296
Neelgund, Y. F., and S. B. Mathad—Nuclear Polyhedrosis of *Pseudaletia separata* (Lepidoptera: Noctuidae) 763
Nelson, S. O., see P. S. Rai 807
Nettles, William C., Jr., Brenda Parro, Carmen Sharbaugh, and Charles L. Mangum—Trehalose and Other Carbohydrates in Diapausing and Starving Boll Weevils ... 554
Nevo, Eviatar, and Syril A. Blondheim—Acoustic Isolation in the Speciation of Mole Crickets 980
Newell, I. M., see G. N. Oldfield 1080
Newton, W. H., M. A. Price, O. H. Graham, and J. L. Trevino—Chromosome Patterns in Mexican *Boophilus annulatus* and *B. microplus* 508
Newton, W. H., M. A. Price, O. H. Graham, and J. L. Trevino—Chromosomal and Gonadal Aberrations Observed in Hybrid Offspring of Mexican *Boophilus annulatus* × *B. microplus* 536
Niedhauk, Russel, see T. Eisner 987
Nielsen, D. G., see W. E. Styer 1089
Nord, John C.—Biology of the Columbian Timber Beetle, *Corthylus columbianus* (Coleoptera: Scolytidae), in Georgia 350
Nord, John C., David G. Grimble, and Fred B. Knight—Biology of *Oberea schaumii* (Coleoptera: Cerambycidae) in Trembling Aspen, *Populus tremuloides* 114
Nord, John C., David G. Grimble, and Fred B. Knight—Biology of *Saperda inornata* (Coleoptera: Cerambycidae) in Trembling Aspen, *Populus tremuloides* 127
Norment, B. R., J. R. Haskins, and L. W. Hepner—A Comparative Electrophoretic Study of Cicadellidae and Membracidae 1149
Norris, Dale M., see Loke Tuck Kok 598

O

OATMAN, E. R.—Topotypic *Trichogramma minutum* (Hymenoptera: Trichogrammatidae) 1239

OATMAN, EARL R., see PATRICK D. GREANY *375, 377,* 991

OATMAN, EARL R., see JOHNSON A. ODEBIYI .. 1104

ODEBIYI, JOHNSON A., AND EARL R. OATMAN—Biology of *Agathis gibbosa* (Hymenoptera: Braconidae), A Primary Parasite of the Potato Tuberworm 1104

OETTING, RONALD D., AND THOMAS R. YONKE—Immature Stages and Notes on the Biology of *Hymenarcys crassa* (Hemiptera: Pentatomidae) 474

OLDFIELD, G. N., I. M. NEWELL, AND D. K. REED—Insemination of Protogynes of *Aculus cornutus* from Spermatophores and Description of the Sperm Cell 1080

OSETO, CHRISTIAN Y., AND T. J. HELMS—Early Embryology and Histology of *Schizaphis graminum* (Hemiptera (Homoptera): Aphidae) 622

OTTE, DANIEL, AND KATHY WILLIAMS—Environmentally Induced Color Dimorphisms in Grasshoppers. *Syrbula admirabilis, Dichromorpha viridis,* and *Chortophaga viridifasciata* 1154

OVERHULSER, DAVID, R. I. GARA, AND R. JOHNSEY—Emergence of *Pissodes strobi* (Coleoptera: Curculionidae) from Previously Attacked Sitka Spruce 1423

P

PARKER, DOUGLAS L., AND MAXINE W. MOYER—Biology of a Leafroller, *Archips negundanus,* in Utah (Lepidoptera: Tortricidae) .. 1415

PARKER, FRANK D.—On the Subfamily Astatinae. Part VII. The Genus *Diploplectron* Fox (Hymenoptera: Sphecidae) 1192

PARR, JOHN C., AND RICHARD THURSTON—Toxicity of Nicotine in Synthetic Diets to Larvae of the Tobacco Hornworm 1185

PARRO, BRENDA, see WILLIAM C. NETTLES, JR. . 554

PATTENDEN, G., AND B. W. STADDON—Identification of *iso*-Butyric Acid in Secretion from Brindley's Scent Glands in *Rhodnius prolixus* (Heteroptera: Reduviidae) 1240

PAYNE, JERRY A., W. L. TEDDERS, G. E. COSGROVE, AND DON FOARD—Larval Mine Characteristics of Four Species of Leaf-Mining Lepidoptera in Pecan 74

PAYNE, THOMAS L., see F. B. CAMORS, JR. .. 31

PAYNE, THOMAS L., see WARREN E. FINN ... 644

PENMAN, DAVID R., AND WYATT W. CONE—Behavior of Male Twospotted Spider Mites in Response to Quiescent Female Deutonymphs and to Web 1289

PERKINS, PETER V., AND T. F. WATSON—Biology of *Nabis alternatus* (Hemiptera: Nabidae) 54

PERKINS, PETER V., AND T. F. WATSON—*Nabis alternatus* as a Predator of *Lygus hesperus* 625

PETERS, DON C., see WAYNE A. ROWLEY 1188

PETERS, WILLIAM L., AND GEORGE F. EDMUNDS, JR.—A Revision of the Generic Classification of Certain Leptophlebiidae from Southern South America (Ephemeroptera) . 1398

PIENKOWSKI, R. L., see G. LEONARD LECATO 319, 979

PITTS, C. W., see RUTH L. HOOPER 577

PLISKE, THOMAS E.—Sexual Selection and Dimorphism in Female Tiger Swallowtails, *Papilio glaucus* L. (Lepidoptera: Papilionidae): A Reappraisal 1267

PRICE, DOUGLAS W.—A New Iolinid Mite from the Galapagos Islands (Acarina: Iolinidae) . 793

PRICE, M. A., see W. H. NEWTON 508, 536

PRICE, ROGER D., AND THERESA CLAY—A Review of the Genus *Austromenopon* (Mallophaga: Menoponidae) from the Procellariiformes 487

PRECACCINI, DONALD J., AND LOUIS S. MARKS—Maculation Pattern in the Subgenus *Protesilaus* (Lepidoptera: Papilionidae). 1. The Development of Wing Pattern in *Papilio agesilaus fortis* 1346

PROVOST, M. W., see J. D. EDMAN 848

PURRINGTON, FOSTER FORBES, AND JAMES S. ULEMAN—Brood Size of the Parasitic Wasp *Hyssopus thymus* (Hymenoptera: Eulophidae): Functional Correlation with the Mass of a Cryptic Host 280

R

RABB, R. L., see C. J. DELOACH 779

RABINOVICH, JORGE E.—Effect of Parental Female Age upon Percent Egg Hatching in *Triatoma phyllosoma pallidipennis* (Hemiptera: Reduviidae) 740

RAI, P. S., H. J. BALL, S. O. NELSON, AND L. E. STETSON—Lethal Effects of Radiofrequency Energy on Eggs of *Tenebrio molitor* (Coleoptera: Tenebrionidae) 807

RANDOLPH, N. M., GEORGE L. TEETES, AND M. C. BAXTER—Life Cycle of the Sunflower Moth Under Laboratory and Field Conditions 1161

RATANAWORABHAN, NIPHAN CHANTHAWANICH, see WILLIS W. WIRTH 1368

REDDY, A. S., see G. M. CHIPPENDALE 882

REED, D. K., see G. N. OLDFIELD 1080

REED, G. L., T. A. BRINDLEY, AND W. B. SHOWERS—Influence of Resistant Corn Leaf Tissue on the Biology of the European Corn Borer 658

REED, G. L., see W. B. SHOWERS 450

RHODES, A. M., see W. L. HOWE 372

RICE, PAUL L., AND GEORGE W. DOUGLAS—Myiasis in Man by *Cuterebra* (Diptera: Cuterebridae) 514

RICE, R. E., see D. S. MORENO 443
RICHERSON, J. V., AND C. J. DELOACH—Some Aspects of Host Selection by *Perilitus coccinellae* 834
RICKS, B. L., AND S. BRADLEIGH VINSON—Changes in Nutrient Content During One Year in Workers of the Imported Fire Ant 135
RIEDEL, SPENCER, AND MURRAY S. BLUM—Rapid Adaptation by Paired Queens of the Honey Bee, *Apis mellifera* 825
RITCHER, P. O., see J. A. KAMM 271
ROBINSON, JOHN F., see JEROME A. KLUN ... 1337
ROEPER, RICHARD A., see JOHN R. J. FRENCH 282, 719
ROGERS, C. E.—Midges Associated with Guar in Texas and Oklahoma 1203
ROGERS, C. E., H. B. JACKSON, R. D. EIKENBARY, AND K. J. STARKS—Host-Parasitoid Interaction of *Aphis helianthi* on Sunflowers with Introduced *Aphelinus asychis, Ephedrus plagiator,* and *Praon gallicum,* and Native *Aphelinus nigritus* and *Lysiphlebus testaceipes* 38
ROGERS, C. E., H. B. JACKSON, G. W. ANGALET, AND R. D. EIKENBARY—Biology and Life History of *Propylea 14-punctata* (Coleoptera: Coccinellidae), an Exotic Predator of Aphids 648
ROGOFF, WM. M., see J. B. KREASKY 1431
ROSALES-RONQUILLO, MARIA C., ROBERT W. SIMONS, AND PAUL H. SILVERMAN—Long-Term Primary Culture of Cells of the Mosquito *Anopheles stephensi* 721
ROSS, HERBERT H., AND K. G. ANDREW HAMILTON—A Review of the North American Leafhopper Genus *Laevicephalus* (Hemiptera: Cicadellidae) 929
ROTH, LOUIS M., see ASHLEY B. GURNEY 521
ROWLEY, WAYNE A., AND DON C. PETERS—Scanning Electron Microscopy of the Eggshell of Four Species of *Diabrotica* (Coleoptera: Chrysomelidae) 1188
RUDINSKY, J. A., see M. M. FURNISS 1227
RYAN, R. B., AND R. D. MEDLEY—Interaction Between Two Parasites, *Apechthis ontario* and *Itoplectis quadricingulatus.* 2. F_1 Progeny Production in Light-Stratified Population Cages 172

S

SANDQUIST, ROGER E., AND GREGORY B. MULKERN—Survival and Development of *Melanoplus femurrubrum* and *M. sanguinipes* (Orthoptera: Acrididae) on Plant-Extract Concentrations and Fractions 1005
SAUER, JOHN R., AND JAKIE A. HAIR—The Quantity of Blood Ingested by the Lone Star Tick (Acarina: Ixodidae) 1065
SAUER, JOHN R., see KENT W. THORNTON ... 872
SAUNDERS, J. L., see H. H. KEIFER 46
SCHAEFER, CARL W.—Degree of Metathoracic Scent-Gland Development in the Trichophorous Heteroptera (Hemiptera) 810
SCHAEFER, CARL W.—A Cladistic Analysis of the Piesmatinae (Hemiptera-Heteroptera: Piesmatidae) 1258
SCHECHTER, M. S., see D. K. HAYES 93
SCHMIDT, C. D.—Classification of the Physiological Development of Laboratory-Reared Female Horn Flies, *Haematobia irritans* ... 695
SCHMITZ, R. F., see M. M. FURNISS 1227
SCHROEDER, LAUREN ALFRED—Energy Budget of Cecropia Moths, *Platysamia cecropia* (Lepidoptera: Saturniidae), Fed Lilac leaves 367
SCHRODER, R. W., see C. C. BLICKENSTAFF ... 336
SELANDER, RICHARD B., AND RICHARD C. WEDDLE—The Ontogeny of Blister Beetles (Coleoptera: Meloidae). III. Diapause Termination in Coarctate Larvae of *Epicauta segmenta* 1
SEVACHERIAN, V., AND D. C. LOWRIE—Preferred Temperatures of Two Species of Lycosid Spiders, *Pardosa sierra* and *P. ramulosa* 111
SHANKLAND, D. L., see LARRY A. CROWDER .. 614
SHARBAUGH, CARMEN, see WILLIAM C. NETTLES, JR. 554
SHARIFI, SADREDDIN—Radiographic Studies of the Parasite *Choetospila elegans* on the Maize Weevil, *Sitophilus zeamaize* 852
SHAW, J. G., see D. S. MORENO 443
SHEPARD, MERLE—Spatial Patterns and Overcrowding of the Bean Leaf Roller, *Urbanus proteus* (Lepidoptera: Hesperiidae) 1124
SHEPARD, MERLE, AND WINFIELD STERLING—Incidence of Parasitism on *Heliothis* spp. (Lepidoptera: Noctuidae) in Some Cotton Fields of Texas 759
SHOREY, H. H., see R. S. KAAE 436
SHOREY, H. H., see L. L. SOWER 954
SHOWERS, W. B., T. A. BRINDLEY, AND G. L. REED—Survival and Diapause Characteristics of Hybrids of Three Geographical Races of the European Corn Borer 450
SHOWERS, W. B., see G. L. REED 658
SHUKLA, G. S., AND V. K. UPADHYAYA—Relative Food Preference of *Dysdercus koenigii* (Hemiptera: Pyrrhocoridae) 762
SHULOV, A. S., see S. A. BLONDHEIM 17
SIDDIQUI, W. H., AND C. A. BARLOW—Population Growth of *Drosophila melanogaster* (Diptera: Drosophilidae) at Constant and Alternating Temperatures 993
SILHACEK, D. L., AND G. L. MILLER—Growth and Development of the Indian Meal Moth, *Plodia interpunctella* (Lepidoptera: Phycitidae), Under Laboratory Mass-Rearing Conditions 1084
SILVERMAN, PAUL H., see MARIA C. ROSALES-RONQUILLO 721
SIMONS, ROBERT W., see MARIA C. ROSALES-RONQUILLO 721

SMITH, CLYDE F.—Synonymy, Redescription, and Biology of *Neoparacletus corrugatans* (Homoptera: Aphididae) 1328
SMITH, CLYDE F., AND H. L. G. STROYAN—The Probable Identity of *Prociphilus (Pulvius) prohosceus* (Homoptera: Aphididae) 804
SMITH, H. W., see JANET L. MOORE 1286
SMITH, J. W., AND H. B. BOUDREAUX—An Autoradiographic Search for the Site of Fertilization in Spider Mites 69
SMITH, J. W., JR., AND G. P. GEORGHIOU—Morphology of the Tymbal Organ of the Beet Leafhopper, *Circulifer tenellus* 221
SMITH, RAY F., see GEORGE TAMAKI 1131
SMITTLE, B. J., see K. W. VICK 790
SMYTHE, RICHARD V.—Feeding and Survival at Constant Temperatures by Normally and Abnormally Faunated *Reticulitermes virginicus* (Isoptera: Rhinotermitidae) 756
SMYTHE, RICHARD V., AND LONNIE H. WILLIAMS—Feeding and Survival of Two Subterranean Termite Species at Constant Temperatures 226
SMYTHE, RICHARD V., AND JOE K. MAULDIN—Soldier Differentiation, Survival, and Wood Consumption by Normally and Abnormally Faunated Workers of the Formosan Termite, *Coptotermes formosanus* 1001
SMYTHE, RICHARD V., see FAIRIE LYN CARTER 655, 686, 984
SOLOMON, J. D., R. E. DOOLITTLE, AND MORTON BEROZA—Isolation and Analysis of the Carpenterworm Sex Pheromone 1058
SOLOMON, J. D., AND W. W. NEEL—Emergence Behavior and Rhythms in the Carpenterworm Moth, *Prionoxystus robiniae* 1296
SONENSHINE, DANIEL E.—Ecology of the American Dog Tick, *Dermacentor variabilis*, in a Study Area in Virginia. 1. Studies on Population Dynamics Using Radioecological Methods 1164
SONENSHINE, DANIEL E., AND GERALD F. LEVY—Ecology of the American Dog Tick, *Dermacentor variabilis*, in a Study Area in Virginia. 2. Distribution in Relation to Vegetative Types 1175
SOWER, L. L., H. H. SHOREY, AND LYLE K. GASTON—Sex Pheromones of Lepidoptera. XXVII. Factors Modifying the Release Rate and Extractable Quantity of Pheromone from Females of *Trichoplusia ni* (Noctuidae) 954
SPANGLER, HAYWARD G.—Daily Activity Rhythms of Individual Worker and Drone Honey Bees 1073
SPARKS, A. N., see W. J. LEWIS 1087
SPOONER, JOHN D.—Courtship in *Falcicula hebardi* (Orthoptera Gryllidae, Trigonidiinae) 1419
SPRATT, GAYLE, see ROY J. BARKER 1236
STADDON, B. W., see G. PATTENDEN 1240
STAFFORD, EUGENE M., see M. TASKEEN ALI-NIAZEE 958
STARKS, K. J., R. MUNIAPPAN, AND R. D. EIKENBARY—Interaction Between Plant Resistance and Parasitism Against the Greenbug on Barley and Sorghum 650
STARKS, K. J., see P. S. JUNEJA 961
STARKS, K. J., see Z. B. MAYO, JR. 671, 925
STARKS, K. J., see C. E. ROGERS 38
STARKS, KENNETH J., see NORMAN V. HORNER 602
STERLING, WINFIELD, see MERLE SHEPARD ... 759
STERN, VERNON M., see AHMAD ASKARI 96
STETSON, L. E., see P. S. RAI 807
STIMMANN, M. W., see W. L. BERRY 236
STONE, ALAN—Synonymic and Other Notes on Tabanidae, with Two New Species (Diptera) 637
STRINGER, CHARLES A., see FAIRIE LYN CARTER 984
STRONG, F. E., see R. L. DUNKLE 705
STROYAN, H. L. G., see CLYDE F. SMITH 804
STYER, W. E., D. G. NIELSEN, AND C. P. BALDERSTON—A New Species of *Trisetacus* (Acarina: Eriophyoidea: Nalepellidae) from Scotch Pine 1089
SUMMERS, C. G., see W. R. COTHRAN 769

T

TAMAKI, GEORGE, AND RAY F. SMITH—Influence of Wind and Migrant Aphid Source on the Flight and Infestation Patterns of the Spotted Alfalfa Aphid 1131
TARSHIS, I. BARRY—The Feeding of Some Ornithophilic Black Flies (Diptera: Simuliidae) in the Laboratory and Their Role in the Transmission of *Leucocytozoon simondi* ... 842
TEDDERS, W. L., see JERRY A. PAYNE 74
TEETES, GEORGE L., see N. M. RANDOLPH 1161
THOMAS, CORINNE M., AND ROBERT J. DICKE—Attraction of the Grain Mite, *Acarus siro* (Acarina: Acaridae), to Solvent Extracts of Fungi Associated with Stored-Food Commodities 1069
THOMPSON, A. C., see R. D. HENSON 981
THOMPSON, S. N., AND J. S. BARLOW—Presence and Synthesis of a 20 Carbon Monounsaturated Fatty Acid, 9-Eicosenoic Acid, and Other Fatty Acids, in *Galleria mellonella* (Lepidoptera: Pyralidae) 1020
THORNBURY, JOHN R., AND ROBERT E. DENTON—Low Kilovoltage Radiography in the Detection of Parasites of the Western Spruce Budworm, *Choristoneura occidentalis* 1232
THORNTON, KENT W., AND JOHN R. SAUER—Physiological Effects of NaCl on *Chironomus attenuatus* (Diptera: Chironomidae) 872
THOTTAPPILLY, GEORGE, JAMES H. TSAI, AND JAMES E. BATH—Differential Aphid Transmission of Two Bean Yellow Mosaic Virus Strains and Comparative Transmission by Biotypes and Stages of the Pea Aphid 912
THURSTON, RICHARD, AND P. M. FOX—Inhibition by Nicotine of Emergence of *Apanteles congregatus* from Its Host, the Tobacco Hornworm 547

THURSTON, RICHARD, see JOHN C. PARR 1185
TILTON, ELVIN W., see SHAHID H. ASHRAFI . 1144
TOCZEK, DONALD R., see GREGORY B. MULKERN 662
TOPOFF, HOWARD—Techniques for Minimizing the Handling of Ants in Behavioral Research: Apparatus That Functions as Both Collection Devices and Experimental Chambers 1428
TOTH, ROBERT S., AND ROBERT M. CHEW—Development and Energetics of *Notonecta undulata* During Predation on *Culex tarsalis* .. 1270
TREVINO, J. L., see W. H. NEWTON 508, 536
TRIPP, JOHN R., AND WILLARD C. MYSER—Descriptive Embryogeny of the Mygalomorph Spider *Antrodiaetus unicolor* 1310
TSAI, JAMES H., JAMES E. BATH, AND E. C. IGBOKWE—Biological and Transmission Characteristics of *Acyrthosiphon pisum* Biotypes Efficient and Inefficient as Vectors of Pea Enation Mosaic Virus 1114
TSAI, JAMES H., see GEORGE THOTTAPPILLY .. 912
TUCKER, K. W., AND M. S. BLUM—No Gibberellic Acid Found in Royal Jelly 989

U

ULEMAN, JAMES S., see FOSTER FORBES PURRINGTON 280
UPADHYAYA, V. K., see G. S. SHUKLA 762

V

VALEK, DOUGLAS A., AND HARRY C. COPPEL—Bionomics of an Oak Defoliating Grasshopper, *Dendrotettix quercus*, in Wisconsin 310
VAN DEN BOSCH, R., see DONALD J. CALVERT 422, 773
VAN PELT, A. F., AND S. A. VAN PELT—*Microdon* (Diptera: Syrphidae) in Nests of *Monomorium* (Hymenoptera: Formicidae) in Texas 977
VAN PELT, S. A., see A. F. VAN PELT 977
VENARD, CARL E., see MARY ELLEN CLAY 964
VICK, K. W., W. E. BURKHOLDER, AND B. J. SMITTLE—Duration of Mating Refractory Period and Frequency of Second Matings in Female *Trogoderma inclusum* (Coleoptera: Dermestidae) 790
VILLACORTA, AMADOR, R. A. BELL, AND J. A. CALLENBACH—Respiratory Activity During Development and Diapause of *Cephus cinctus* (Hymenoptera: Cephidae), with Emphasis on Effect of Temperature 419
VINSON, S. B.—Imported Fire Ant Feeding on *Paspalum* Seeds 988
VINSON, S. BRADLEIGH—Competition and Host Discrimination Between Two Species of Tobacco Budworm Parasitoids 229
VINSON, S. BRADLEIGH, see B. L. RICKS 135
VITÉ, J. P., see JACK E. COSTER 263
VOORHEES, FRANK RAY, see WILLIAM R. HORSFALL 123

W

WALKER, ALTON I., see RICHARD C. FOX 513
WALKER, THOMAS J., AND ASHLEY B. GURNEY—Systematics and Acoustic Behavior of *Boringuenula*, a New Genus of Brachypterous Coneheaded Katydids Endemic to Puerto Rico (Orthoptera. Tettigoniidae, Copiphorinae) 460
WALLER, GORDON D.—Evaluating Responses of Honey Bees to Sugar Solutions Using an Artificial-Flower Feeder 857
WALT, J. F., AND J. E. MCPHERSON—Laboratory Rearing of *Stethaulax marmoratus* (Hemiptera: Scutelleridae) 1242
WALTON, G. S., see D. M. DUNBAR 1419
WATSON, T. F., see PETER V. PERKINS 54, 625
WATTS, J. G.—Descriptions and New Distribution Records of *Chirothrips* (Thysanoptera: Thripidae) 589
WEDDLE, RICHARD C., see RICHARD B. SELANDER 1
WELLSO, STANLEY G.—Reproductive Systems of the Cereal Leaf Beetle. Comparison of Morphology During Seasonal Development . 945
WELLSO, STANLEY G., CHUNG LEE, AND ROBERT P. HOXIE—Inheritance of a Dark Mutant of the Cereal Leaf Beetle 558
WESELOH, RONALD M. —Sense Organs of the Hyperparasite *Cheiloneurus noxius* (Hymenoptera: Encyrtidae) Important in Host Selection Processes 41
WESELOH, RONALD M.—Influence of Gypsy Egg Mass Dimensions and Microhabitat Distribution on Parasitization by *Ooencyrtus kuwanai* 64
WESELOH, RONALD M.—Field Responses of Gypsy Moths and Some Parasitoids to Colored Surfaces 742
WESELOH, RONALD M.—Diel Periodicities of Some Parasitoids of the Gypsy Moth and Noctuid Cutworms 1126
WESELOH, R. M., see D. M. DUNBAR 1419
WESTFALL, JANE A., see RUTH L. HOOPER ... 577
WHITACRE, D. M., see C. G. MOORE 915
WHITCOMB, ROBERT F., JAMES P. KRAMER, AND MICHAEL E. COAN—*Stirellus bicolor* and *S. obtutus* (Homoptera: Cicadellidae): Winter and Summer Forms of a Single Species 797
WHITMOYER, ROBERT E., L. R. NAULT, AND O. E. BRADFUTE—Fine Structure of *Aceria tulipae* (Acarina: Eriophyidae) 201
WILKINSON, R. C., see W. C. YEARIAN 481
WILLIAMS, KATHY, see DANIEL OTTE 1154
WILLIAMS, LONNIE H.—Anobiid Beetle Eggs Consumed by a Psocid (Psocoptera: Liposcelidae) 533
WILLIAMS, LONNIE H., see RICHARD V. SMYTHE 226

WILSON, B. H., AND MEREDITH LIEUX—Pollen Grains in the Guts of Field Collected Tabanids in Louisiana 1264
WILSON, LOUIS F., see ELDON A. BEHR 457
WILSON, THOMAS H.—*Apollothrips bhattii,* a New Genus and Species of Thrips (Thysanoptera: Thripidae) from Central India, with a Synopsis of Related Genera 49
WILSON, THOMAS H., AND TIM A. COOLEY—A Chalcidoid Planidium and an Entomophilic Nematode Associated with the Western Flower Thrips 414
WILSON, WILLIAM T., see ALBERT R. BITNER 899
WIRTH, WILLIS W.—The Neotropical *Forcipomyia (Microhelea)* Species Related to the Caterpillar Parasite *F. fuliginosa* (Diptera: Ceratopogonidae) 564
WIRTH, WILLIS W., AND MARK I. DOW—Studies on the Genus *Forcipomyia* 4. *Rhynchoforcipomyia,* a New Neotropical Subgenus in the *Trichohelea* Complex (Diptera: Ceratopogonidae) 862
WIRTH, WILLIS W., AND NIPHAN CHANTHAWANICH RATANAWORABHAN—A Revision of the Tribe Stenoxenini (Diptera: Ceratopogonidae) 1368
WIRTH, WILLIS W., see MARK I. DOW 177
WISEMAN, B. R., see RICHARD L. JONES 821
WITTER, J. A., H. M. KULMAN, AND A. C. HODSON—Life Tables for the Forest Tent Caterpillar 25
WIYGUL, GLENN, see NORMAN MITLIN 612
WOLF, W. W., see W. L. Berry 236
WRENN, R. T., see C. A. BENSCHOTER 641
WYNN, GAIL G., AND H. BRUCE BOUDREAUX—Structure and Function of Aphid Cornicles 157

Y

YATES, HARRY O., III, AND BERNARD H. EBEL—Shortleaf Pine Conelet Loss Caused by the Nantucket Pine Tip Moth, *Rhyacionia frustrana* (Lepidoptera: Olethreutidae) 100
YEARIAN, W. C., R. J. GOUGER, AND R. C. WILKINSON—Effects of the Bluestain Fungus, *Ceratocystis ips,* on Development of *Ips* Bark Beetles in Pine Bolts 481
YONKE, THOMAS R., see RONALD D. OETTING 474

Z

ZDARKOVA, EVA, see W. L. HOWE 372

SUBJECT INDEX, VOLUME 65, 1972

Compiled by Gladys O. Visel

(All new names are printed in *italics*)

A

Aanacanthocoris striicornis, 815
Abdominal: glands in introduced pine sawfly, 33
  nerves of house fly, 689
Abundance of northern walkingstick, 877
Acalymma vittatum, host preferences, 372
Acanthocephala femorata, 815
  terminalis, 815
Acanthocoris sordidus, 815
Acantholybas brunneus, 815
Acanthomia histrix, 814
  horrida, 814
Acanthophysa echinata, 814
Acarina, 46, 61, 69, 201, 508, 536, 730, 793, 1065, 1069, 1080, 1089, 1099, 1164, 1175, 1289
Acarus siro, attraction by fungi, 1069
Aceratagallia calcaris, 168
  uhleri, 168
Aceria tulipae, fine structure, 201
Acheta configuratus, 282
  domesticus, 282
Achroblatta, 525
  luteola, 525, 891
Aclerda, new species, 1261
  chusqueae, 1264
  tillandsiae, 1262
Acleris gloverana, 173
Acoustic: communication in biology of grasshoppers, 17
  isolation in mole cricket speciation, 980
Acroneuria abnormis, 111
Acrosternum hilare, 816
Acrotylus insubricus, acoustic communication in biology, 17
  patruelis, acoustic communication in biology, 17
Aculus cornutus, insemination, 1080
Acyrthosiphon pisum, 422, 774, 893, 912
  population growth, 1011
Adalia bipunctata, 835
Adaptation of honey bee queens, 825
Aedes, eggs of, 123
Aedes aegypti, 967, 1299
  determination of cell numbers in, 829
  production of larval growth, 915
  resistance to desiccation, 542
  sensilla chaetica structure on antennae, 1390
Aedes aegypti formosus, 543
  atropalpus, resistance to desiccation, 542
  atropalpus epactius, 544
  atropalpus nielseni, 544
  atropalpus perichares, 544
  barri, 125
  canadensis, 125
  cinereus, 124
  communis, 125
  dianteus, 125
  excrucians, 124
  fitchii, 124
  flavescens, 125
  grossbecki, 126
  hexodontus, 124
  intrudens, 125
  pionips, 124
  pullatus, 124
  punctor, 125
  sticticus, 125
  stimulans, 126
  stimulans, growth, 1425
Aedes taeniorhynchus, insemination, 285
  mating and insemination, 848
Aedes trichurus, 124
  triseriatus, fine structure of diverticula, 964
  vexans, growth, 1425
  vexans, insemination by induced copulation, 293
Aelia acuminata, 816
Aenictus sp., nr. camposi, 1024
Aetalion reticulatum, 222
Aethus nigritus, 815
Agallinae, 168
Agapostemon melliventris, 1431
Agathis gibbosa, biology, 1104
Age: interaction and radiation dosage, 1237
  related changes in Hippelates spp., 1092
Agriopocoris froggatti, 814
Agriphila ruricolella, 246
  vulgivagella, 246
Agrotis ipsilon, 983
Airplane-collected insects, 1431
Alarm pheromone of honey bee, 1430
Alepidophora *maxima*, 1421
Aleochara bimaculata, 1334
  bipustulata, 1334
Alfalfa leafcutter bee, fat body inclusions, 1286
Alfalfa weevil, biology and ecology, 336
  mortality of pupae from gamma irradiation, 1331
  oviposition, 979
  reproduction, 319
Alydus eurinus, 814
  pilosulus, 814
Amaurchrous cinctipes, 816
Amblyomma americanum, 1065
  maculatum, muscles, 61
Amblyopone, new species, taxonomy and biology of, 383
  denticulata, 383
  emeryi, 383
  mutica, 383
  normandi, 383
  pallipes, 388
  pluto, 384
  santschii, 383
Ambrosia beetle: and microbes, 598
  culture, 719
Ambrosiella ferruginea, primary fungus of Trypodendron rufitarsis, 282
  hartigii, symbiotic fungus of ambrosia beetle, 719
American cockroach, hyperglycemic agent in serum, 299
  malpighian tubule muscle, 614
American dog tick, distribution, 1175
  ecology, 1164, 1175
Amnestus pusillus, 815
Amorbus robustus, 815
Amphicrossus ciliatus, 357
Amphorophora, 159
  rubitoxica, 426, 774
  sonchi, 158
Anagasta kuehniella, 90
Anarete buscki, 1207
Anasa tristis, 815
Anastatus disparis, 65
Anastrepha suspensa, courtship behavior, 1364
Anatomy of selected systems of Phyllophaga auxia, 1026
Anchoblatta peruana, 525
  signifera, 525

Anobiid beetle eggs consumed by a psocid, 533
Anolina, new genus, 794
lineata, 794
Anomopsocus, 1361
synonymy, species, and taxonomic position, 1359
Anomopsocus amabilis, 1359
radiolosus, 1360
Anopheles barberi, 967
pseudopunctipennis franciscanus, 1271
punctipennis, dehydrogenase polymorphism in, 798
quadrimaculatus, 967
stephensi, culture of cells, 721
Anoplocnemis dallasi, 815
Antennal sensillum of Blattella germanica, new, 888
Antestiopsis tacetoides, 816
Anthonomus aeneolus, 1215
bicoriae, 1223
bolteri, 1223
convictus, 1216
cycliferus, 1221
elegans, 1220
gall-inhabiting weevils of, 1215
grandis, 554, 612, 942, 981
haematopus, 1221
irroratus, 1219
juniperinus, 1222
ligatus, 1222
morulus, 1222
sexguttatus, 1223
suturalis, 1222
Antillocoris minutus, 812
pilosulus, 812
Antilochus lineatipes, 814
nigripes, 814
Antipsocus, synonymy, species, and taxonomic position, 1359
Antricola (Antricola), 731
(A.) coprophilus, 731
(Parantricola) marginatus, 731
(A.) mexicanus, 731
(A.) silvai, 731
Antrodiaetus labyrinthica, 1316
unicolor, embryogeny, 1310
Ants, chromosomes of 9 species, 1023
minimizing handling in behavioral research, 1428
Aonidiella aurantii, 1283
citrina, 1283
citrina, sex pheromone of, 443
Apanteles congregatus, 779
inhibition of emergence by nicotine, 547
Apanteles laeviceps, 743, 1126
marginiventris, 759
melanoscelus, 743
spp., 86
Apechthis ontario, 173
and Itoplectis quadricingulatus interaction, 172
Aphaenogaster tipuna, 1024
Aphelinus asychis introduced on sunflowers, 38
nigritus on sunflowers, 38
Aphid(s): cornicles, structure and function, 157
Propylea 14-punctata predator of, 648
wind migration of, 1131
Aphidius, 777
rubitoxica, 426
smithi, 426
sp., 426, 778
Aphis, 159
craccivora, 158
fabae, 158
gossypii, 157
helianthi, host-parasitoid interaction, 38
spiraecola, 158
Aphodius coloradensis, 1334
distinctus, 1334
fimetarius, 1334
fossor, 1334
granarius, 1334
haemorrhoidalis, 1334
prodromus, 1334
ruricola, 1334
sterocorosa, 1334
vittatus, 1334
Apis mellifera, 270, 440, 857, 942, 989, 1073, 1236, 1430, 1431
adaptation of queens, 825
passage of Bacillus larvae spores from honey bees, 899
proteins of, 516
Apollothrips bhattii and related genera, 49
Apomyrma stygia, 388
Apterola kunckeli, 813
Arachnida, 111
Araneae, 1310
Archimandrita tessellatta, 891
Archipolipus, 1100
Archips negundanus, biology, 1415
Archytas apicifer, 1345
marmoratus, 759
Argas (Argas), 730
Argas (Persicargas), 730
Argas (P.) arboreus, tritiated tyrosine in, 746
(A.) brevipes, 730
(A.) cooleyi, 730
(P.) giganteus, 730
(P.) miniatus, 731
(A.) neghmei, 730
(P.) persicus, 731
(P.) radiatus, 731
(P.) sanchezi, 730
Argasidae, key to larval, 730
Argia translata, 111
Armyworm scent brush secretion, 1224
Artemia salina, 756
Arthropods, defense mechanisms of, 765
Aspergillus flavus, 1070
repens, 1070
ruber, 1070
Asphondylia sp., 1207
Aspilocoryphus fasciativentris, 813
Astata, 1192
Astatinae—the genus Diploplectron, 1192
Ataenius californicus, 1431
spretulus, 1334
Atalonella, 1411
grandis, 1411
maculata, 1411
ophis, 1411
spp., 1411
Atherigona varia soccata, life history, 586
Athysanella argenteola, 170
attenuata, 170
contracta, 170
emarginata, 170
occidentalis, 170
redacta, 170
texana, 170
Athysanus obtutus, 798
Atrachya menetriesi, 769
Atrichopogen microtomus, 569
Attagenus megatoma, 247
Atylotus lacrymans, 638
Atypus karschi, 1317
Aufeius impressicollis, 1193
Aulacigaster leucopeza, 357
Aulochara elliotti, 557
Austromenopon, review of genus, 487
affine, 488
batutuense, 493
brevifimbriatum, 494
bulleri, 491
bulweriae, 493
echinatum, 497
edwardsi, 499
elliotti, 496
enigki, 493
fraterculae, 494
longithoracicum, 497
narboroughi, 499
navigans, 490
oceanodromae, 501
oschei, 494
ossifragae, 491
paululum, 494
pelagicum, 501
piekarskii, 494
pinguis, 490
popellus, 491
stammeri, 496
Autoradiographic search for fertilization site of spider mites, 69

B

Bacillus larvae, passage of spores from queen honey bees, 899
Bactrodosoma parallela, 814
Bactrophya sp., 814
Bakerpolipus, 1100
Balboa ampliata, 812
Balclutha diluta, 170
hebe, 170
incisa, 170
neglecta, 170
Baldcypress, extractives and eastern subterranean termite, 686
Banasa calva, 816
dimidiata, 816
Barademus attenuatus, 813
Barley, resistance to greenbug, 650, 961
Bassus gibbosus, 1104
Bathyplectes anurus, 347
contracta, 347
curculionis, 346
Battus philenor, 1267
Bean leaf roller, spatial patterns and overcrowding, 1124
Bean yellow mosaic virus transmission, 912
Bee fly, fossil, new species, 1421

Beet armyworm, sex pheromone of, 898
Beet leafhopper, tymbal organ, 221
Behavior: and insemination of house fly 689
calling, in pink bollworm, 281
courtship, of Anastrepha suspensa, 1364
keyboard for recording, 278
mating, of European corn borer, 1016
mating, of Trogoderma inclusum, 791
releasing, of Trichoplusia ni, 436
sexual, of mosquitoes, 285, 290
Behavior of: *Borinquenula*, 460
carpenterworm moth, 1296
face fly, 607
Geocoris punctipes, mating, 764
grasshoppers, 19
Monoctonus paulensis, 773
mosquitoes, sexual, 267
two-spotted spider mite, 1289
Behavioral research, minimizing ant handling in, 1428
Benzyl alcohol as resistance factor, 961
Bioassay of Dioryctria abietella, 1208
Biolleya, 526
alaris, 526
Biology, reproductive, of cigarette beetle, 447
Biology of: Agathis gibbosa, 1104
Columbian timber beetle, 350
European corn borer, influence of corn leaf tissue on, 658
grasshoppers, acoustic communication in, 17
Hapsiphlebia, 1404
Hymenarcys crassa, 474
Hypera postica, 336
leafroller, 1415
Massartella, 1405
Massartellopsis, 1411
Meridialaris, 1408
Monoctonus paulensis, 773
Nabis alternatus, 54
Neoparacletus corrugatans, 1328
new Amblyopone species, 383
new Anthonomus species, 1215
Oberea schaumii in trembling aspen, 114
Orius tristicolor, 96
pavement ant, 358
Penaphlebia, 1401
pine looper, 306
pinyon spindle gall midge, 331
Propylea 14-punctata, 648
rice water weevil, 990
Saperda inornata in trembling aspen, 127
Sarcophaga tibialis, 400
sheep biting louse, 1182
Bionomics of: grasshopper, 310
jumping spider, 602
Biosynthesis of uric acid in boll weevils, 612
Biotypic transmission of Acyrthosiphon pisum, 1114
Bittacus apicalis, 1309
Blaberidae, 521
Blaberus craniifer, 891
discoidalis, 891
giganteus, 891
Black carpet beetle, ultrastructure, 247
Black fly, feeding, 842
Black turpentine beetle, infesting pines, 269
Black walnut, extractives and eastern subterranean termite, 686
Blaesoxipha sp., 318
Blatta orientalis, 891
Blattaria, 521
Blattella germanica, 641, 891
new antennal sensillum, 888
Bledius sp., 1431
Blepheripa scutellata, 1126
Blister beetles, ontogeny, 1
Blood ingestion of lone star tick, 1065
Bluestain fungus effect on Ips bark beetles, 481
Boettcheria cimbicis, 1345
Boll weevil, biosynthesis of uric acid in, 612
carbohydrates in, 554
constituents, 981
reducing microsporidian disease in, 942
Boophilus annulatus, chromosomes, 508, 536
Boophilus microplus, chromosomes, 508, 536
Borinquenula, behavior, 460
Borinquenula caritensis, 468
martorelli, 462
minor, 469
Bovicola bovis, colonization, 771
ovis, 1182
Brachyacantha ursina, 837
Brachymeria compsilurae, 1126
Brachynemurus quadripunctatus, 1431
Brachyrhinus spp., 271
Brachytes bicolor, 815
Bracon brevicornis, 90
hebetor, 90
Braconid venom and host discrimination, 90
Bradysia sp., 1207
Brevicoryne brassicae, 834
Brindley's scent glands, iso-Butyric acid in, 1240
Brochymena quadripustulata, 816
Brood size of Hyssopus thymus, 280
Brotheolus viridis, 814
Bryodema tuberculata, 24
Buooblatta armata, 891
Bufolucilia silvarum, 1342
Byrsotria fumigata, 891

C

Cabbage looper, comparison of tympanic membrane with corn earworm, 918
sense organs, 296
Cabbage maggot populations and thermal units, 151
Cachryphora, 159
serotinae, 158
Caddisfly cases, fossil, 518
Cadra cautella, 898, 1280
figuliella, sex pheromone from, 1356
California red scale, site of sex-pheromone producing organ in, 1283
Calliphora vicina, 1345
vomitoria, 1345
Callisthenes luxatus, defensive chemistry, 275
Callosobruchus analis, 1241
chinensis, 1241
maculatus and hybridization, 1241
Campodon ocreatus, 978
Campolestes perdistinctus, 230
Camponotus floridanus, 987
(Myrmosericus) sp., 586
sp. (variegatus complex), 1025
Cantao parentum, 816
Capucina patula, 891
Carbohydrates in boll weevils, 554
Carbon dioxide effect on Plodia interpunctella eggs, 976
Cardiochiles nigriceps, 230, 759
Caribbean fruit fly, courtship behavior, 1364
Carneocephala flaviceps, 1150
sp., 1153
Carpenterworm sex pheromone, isolation and analysis, 1058
Carpilis consimilis, 812
Carya illinoensis, 74
Caterpillar, acids in spray, 765
defense against ants, 987
Catorhintha guttula, 815
mendica, 815
Cattle biting louse, colonization, 771
Cavellerius saachivorus, 813
Cecidomyia texana, 1204
Cecropia moth, energy, 367
Cephus cinctus, respiratory activity during development and diapause in, 419
Ceraleptus gracilicornis, 814
Ceratina sp., 755
Ceratitis capitata, 1238
Ceratocystis ips effect on Ips bark beetles, 481
Ceratopogon coquilletti, 569
hirtus, 183
propinquus, 560
terminalis, 1369
tropicus, 569
Ceratopogonidae, 270
Cercyon lateralis, 1334
praetestatus, 1334
pygmaeus, 1334
quisquilius, 1334
unipunctatus, 1334
Cercyothrips, 50
Cereal leaf beetle, mutant, 558
reproductive systems, 945
Chalcidoid planidia on thrips, 414
Chaoborus americanus, control in diapause initiation, 755
Charlesterus antennator, 815
Chauliodes pectinicornis, commensalistic relationship with Plecoptera-coluthus, 109
Cheiloneurus noxius, sense organs, 41
Chelinidea vittiger aequoris, 815
Chemicals in corn, 821

Chironomidae, 270
commensal, 109
Chironomus attenuatus, NaCl effects on, 872
plumosus, 873
Chirothrips, distribution, 589
crassus, 593
crenulatus, 591
cuneiceps, 593
insolitus, 589
lenape, 592
mexicanus, 593
oneillae, 589
patruelis, 592
simplex, 594
spiniceps, 594
texanus, 593
vestis, 593
Chlorotettix sp., 1153
spatulatus, 170
viridius, 1150
Choetospila elegans, radiographic studies of, 852
Chorion and sodwebworm eggs, 238
Choristoneura occidentalis, 173
detection of parasites of, 1232
Choristoneura pinus, 82
Chortophaga viridifasciata, color dimorphisms in, 1154
Chromosomes of: ants, 1023
aphids, 925
Boophilus spp., 508, 536
Chrysoteuchia topiaria, 239
Cicadellidae, electrophoretic study, 1149
Cicadellinae, 170
Cigarette beetle, biology, 447
Cinara carolina, 158
spp., 161
watsoni, 158
Circadian rhythms of Serotonin in Drosophila, 138
Circulifer tenellus, 170
tymbal organ, 221
Citrus fruits, artificial infestation, 1238
Cladistic analysis of Piesmatinae, 1258
Clavigralla horrens, 814
Cletus rusticus, 815
Cnemodus mavortius, 812
Cnephia invenusta, 842
ornithophilia, 842
Coccinella novemnotata, 835
Coccipolipus, 1099
hippodamiae, 1100
macfarlanei, 1101
solanophilae, 1100
Coccus hesperidum, 42
Cochliomyia macellaria, 1342
Cockroaches of subfamily Panchlorinae, 521
Codling moth, respiration rhythms in larvae, 93
Codophila vaira, 816
Coelopisthia suborbicularis, 309
Coleomegilla maculata, 835
Coleophora sp., 1104
Coleoptera, 1, 31, 114, 127, 247, 263, 275, 282, 319, 336, 350, 372, 406, 447, 481, 513, 533, 550, 554, 558, 612, 619, 631, 644, 648, 675, 719, 755, 757, 768, 769, 772, 790, 807, 852, 945, 950, 979, 981, 990, 1026, 1076, 1099, 1215, 1227, 1237, 1241, 1243, 1293, 1319, 1324, 1331, 1349, 1388, 1423
Coleoptera, succession, 1333
Colobathristes chalcocephalus, 814
sp., 816
Colonization of: cattle biting louse, 771
Lutzomyia, 683
Colony founding by red imported fire ant, 1053
Color dimorphisms in grasshoppers, induced, 1154
morphs of Papilio glaucus, 1267
Colored surfaces, gypsy moth responses to, 742
Colpura lativentris, 815
Columbian timber beetle, 350
Commellus sexvittatus, 170
Commensal Chironomidae, 109
Competition: and host discrimination between tobacco budworm parasitoids, 229
in mosquitoes, 915
Coneheaded katydids, new genus of, 460
Constituents of boll weevil, 981
Contarinia sorghicola, 1207
spp., 1207
Control: in diapause initiation by Chaoborus americanus, 755
of Hessian fly copulations, 750
tansy ragwort, 406
Copris tullius, 1334
Coptodisca lucifluella, 74
Coptotermes formosanus, 226
defaunation of workers, 1001
Coreocoris confluens, 815
Corimelaena 1. lateralis, life history of, 906
Coriomerus lusticornis, 814
Corn, chemicals in, 821
Corn earworm, comparison of tympanic membrane with cabbage looper, 918
feeding response of larvae to chemicals, 821
Corn leaf aphid, ^{75}Se in feeding, 303
Corn leaf tissue influence on biology of European corn borer, 658
Corydalus cornutaus, 111
Corthylus columbianus, biology, 350
Cosmoleptus bakeri ?, 814
Cotton fields, Heliothis spp. parasitism in, 759
Courtship of Falcicula hebardi, 1417
Crambus alboclavellus, 241
decorellus, 241
laqueatellus, 241
pascuellus floridus, 246
praefectellus, 241
teterrellus, 246
Crataegus spp., 1328
Crematogaster castanea inversa, 586
Cribrus concinnus, 929
Cryptocercus punctulatus, 891
Cryptopleurum minutum, 1334
Cuerna costalis, 1150
Culex, rearing and marking, 267
Culex erythrothorax, 1271
nigripalpus, 267, 285
nigripalpus, insemination, 290
pipiens, 967
pipiens, insemination, 285
pipiens molestus, 285
pipiens quinquefasciatus, 267, 285, 1299
pipiens quinquefasciatus, insemination, 290
tarsalis, Notonecta undulata predation on, 1270
Culiseta inornata, 1271
Culture of: Ambrosia beetle, 719
Anopheles stephensi cells, 721
Cuterebra, myiasis by, 514
Cycloneda munda, 835
sanguinea, new genus and species of mite associated with, 1099
Cydamus inauratus, 814
Cydistomyia (Lissomodes) ceylonica, 637
Cymus angustatus, 812
luridus, 812
Cynomyopsis cadaverina, 1345
Cyphoderus similis, 361

D

Dactynotine aphids, parasite of, 773
Dalader sp., 815
Damage in house fly tissues, 504
Darmistus sp., 814
DDT-prostrate American cockroaches, hyperglycemic agent in, 299
Defense: in caterpillar against ants, 987
mechanism of arthropods, 765
Defensive: chemistry of ground beetle, 275
scent fluid of Pasimachus elongatus, 772
secretion of Dineutes discolor, 1324
Dehydrogenase polymorphism in Anopheles punctipennis, 798
Deleatidium, 1413
Deltocephalinae, 170
Deltocephalus balli, 170
concinnus, 929
convergens, 929
grex, 170
incisurus, 929
nigripennis, 929
sonorus, 170
Dendroblatta sobrina, 891
Dendroctonus brevicomis, 1230
frontalis, 263
frontalis, response of Heydenia unica to, 31
pseudotsugae, 550, 1227
rufipennis, 550

terebrans, 269
valens, 550
Dendrosoter protuberans, development on smaller European bark beetle, 757
Dendrotettix quercus, bionomics, 310
Deraeocoris *madisonensis*, 840
manitou, 841
pinicola, 841
Dermacentor variabilis, ecology, 1164, 1175
Desiccation in Aedes, resistance to, 542
Determination of cell numbers in Aedes aegypti, 829
Development of: Dendrosoter protuberans on smaller European bark beetle, 757
Geocoris punctipes, 892
Indian meal moth, 1084
Tribolium castaneum, 631
Devorgilla (Nemeritis) canescens, 230
Diabrotica, microscopy of eggshell, 1188
cristata, 1189
longicornis, 451, 769, 1188
undecimpunctata howardi, 451, 768, 835, 1188
virgifera, 451, 1188
virgifera, embryonic stage, 768
Diaeretus sp., 426
Diapause, termination in Epicauta segmenta, 1
Diapause in: parasites of Hypera postica, 105
Sarcophaga bullata, 410
Diapause of: Cephus cinctus, 419
European corn borer, 450
southwestern corn borer, 882
Diapausing European corn borers and photophase and temperature, 433
Diapheromera femorata, abundance, 876
Diatraea grandiosella, diapause, 882
Dibrachoides druso, 105, 347
Dichaeta, 270
Dichromorpha viridis, color dimorphisms in, 1154
Dicranoneura prob. loca, 170
Dictyoptera, 521, 614, 888
Diel periodicities of parasitoids, 1126
Diet, for Geocoris punctipes, 892
synthetic, toxicity of nicotine in, 1185
Diet of: honey bee, pollen in, 270
Dieuches discoguttatus, 812
Digital electrolytic microrespirometer, 705
Dikraneura spp., 160
Dinarmus sp., 755
Dinenympha, 756
Dineutes discolor, defensive secretion of, 1324
Dioctria *jamesi*, 276
Dioryctria abietella, female sex pheromone of, 1208
amatella, 101
clarioralis, 101
Diploplectron, descriptions of species, 1192
Diploplectron ashmeadi, 1197
asiaticum, 1193
beccum, 1195
brunneipes, 1197
californicum, 1199
cressoni, 1197
diablense, 1202
ferrugineum, 1197
fossor, 1198
irwini, 1200
kantsi, 1201
kriegeri, 1193
neotropicum, 1202
orizabense, 1201
palearcticum, 1193
peglowi, 1198
relativum, 1197
reticulatum, 1202
rufoantannatum, 1198
secoense, 1201
sierrense, 1199
vierecki, 1200
Diploptera punctata, 891
Diprion similis, 1424
abdominal glands in, 33
Diptera, 109, 123, 138, 151, 177, 267, 270, 275, 285, 290, 293, 323, 328, 331, 396, 400, 410, 504, 514, 542, 564, 577, 586, 594, 607, 637, 683, 689, 695, 721, 750, 755, 779, 798, 829, 842, 848, 862, 872, 915, 964, 977, 993, 1092, 1203, 1238, 1245, 1299, 1368, 1390
Diptera, muscoid, plaques on antennae, 1340
Dissection of insects and ovarial development, 271
Distribution of: American dog tick, 1175
Chirothrips, 589
Diversinervus elegans, 42
Dolichopodidae, 270
Dolycoris baccarum, 816
Dorpius indicus, 816
Dorsipes, 1100
Dorycephalinae, 167
Dorycephalus sp., 167
Douglas-fir beetle, pheromones against, 1227
Draeculacephala balli, 1150
crassicornis, 272
mollipes, 170
portola, 1150
sp., 1153
Drosophila melanogaster, 359, 603
circadian rhythms of Serotinin in, 138
population growth, 993
robusta, 357
spp., 112
virilis, 799
Drymus crassus, 812
unus, 812
Dryocoetes autographus, 550
Dryudella, 1192
Dysdercus andreae, 814
food preference, 762
koenigi, 814

E

Eastern subterranean termite: fatty acids of, 655
feeding, 457
wood extractives and survival, 686
Echinothrips, 50
Ecology of: American dog tick, 1164, 1175
Hypera postica, 336
Ectopsocopsis, 1363
Ectopsocus, 1363
Egg(s): clusters, fungus and 1417
hatch and parental age in Triatoma, 740
histochemistry of, 519
of floodwater mosquitoes, 123
Egyptian alfalfa weevil, fall movement, 769
Egg clusters, fungus on gypsy moth, 1417
Elasmopalpus lignosellus, 1280
Electromyograms from flying moths, recording, 982
Electron microscopy of wounds from Trichogramma, scanning, 760
Electrophoretic study of Cicadellidae and Mebracidea, 1149
Emblethis vicarius, 812, 1193
Embryogeny of Antrodiaetus unicolor, 1310
Embryology of Schizaphis graminum, 622
Embryonic stage of Diabrotica virgifera, 768
Emergence of: carpenterworm moth, 1296
Pissodes strobi from Sitka spruce, 1423
Empididae, 270
Empoasca spp., 170
Enaphalodes rufulus, 1243, 1421
Endria inimica, 170
Energy of cecropia moths, 367
Enneothrips, 50
Ephedrus californicus, 426
lacertosus, 426
plagiator introduced on sunflowers, 38
sp., 426, 777
Ephestia elutella, 1358
Ephydra cinerea, 1431
Epicauta immaculata, 2
segmenta, diapause termination in larvae, 1
sp., 566
Epilachna varivestis, 277, 835
host preferences, 675
Epilampra abdomennigrum, 891
grisea, 891
Eremocoris ferus, 812
Esperanza texanum, 814
Eublaberus posticus, 891
Eucelatoria armigera, 760
Euchromius sp., 1431
Eucosma cocana, 101
Eupadodus mundus, 816

Euphemeroptera, 1398
Euphorocera nr. edwardsii, 309
Euphyllodromia angustata, 891
Eupithecia misturata, 630
European corn borer, and photophase and temperature, 433
corn leaf tissue influence on biology, 658
diapause, 450
mating behavior, 1016
olfactory discrimination in, 1337
Eurycotis floridana, 891
Eurydema festivum, 816
olivacea, 816
Eurygaster maura, 816
Euryophthalmus cinctus, 814
sellatus, 814
Euschistus ictericus, 816
servus, 911
t. tristigmus, 911
Euscopus rufipes, 814
Eutarsopolipus, 1100
Euthera tentatrix, 478
Euthochtha galeator, 815
Eutreta pacifica, 630
Exitianus exitiosus, 171, 1150
sp., 1153
Exopamera aethiopica, 812
mirabilis, 812
Extractives of baldcypress, black walnut, and redwood, 686
Extrusanus ovatus, 170
Eyes in scolytid beetles, 550

F

Face fly, sense organs on ovipositor, 577
sex pheromone and behavior, 607
Falagria dissecta, 1334
Falcicula hebardi, courtship, 1417
Fall movement of Egyptian alfalfa weevil, 769
Fannia canicularis, 1342
Fat: body inclusions of alfalfa leafcutter bee, 1286
content of Sarcophaga tibialis, 396
Fatty acids: Galleria mellonella, 1020
of eastern subterranean termite, 655
Feature photograph, facing p. 1, 285, 521, 772, 993, 1197
Feeding, and survival of subterranean termites, 226
ornithophilic black flies, 843
response of corn earworm larvae, 821
Feeding by: eastern subterranean termite, 457
phytophagous insects, photography in, 277
Feeding of: Geocoris punctipes, 892
Reticulitermes virginicus, 756
soybean-associated insects, 675
Fertilization site of spider mites, 69
Fine structure of mosquito diverticula, 962
Flagellar sense receptors of Peridesmia discus and Nasonia vitripennis, 1119
Flea beetle to control tansy ragwort, 406
Flexamia abbreviata, 170
albida, 170
atlantica, 170
curvata, 170
flexulosa, 170
pectinata, 170
sandersi, 797
Floodwater mosquito eggs, 123
Flying moths, recording electromyograms from, 982
Folindusia *rubiensis*, 518
Food preference of Dysdercus koenigii, 762
Forcipomyia (Synthyridomyia), 193
Forcipomyia (Thyridomyia), 179
Forcipomyia (Microhelea), related to F. fuliginosa, 564
Forcipomyia, studies on, 177, 862
abludens, 177
aspinosa, 180
(Rhynchoforcipomyia) brachyrhynchus, 867
brookmani, 569
(Synthyridomyia) colemani, 193
crudelis, 569
(R.) cylindrica, 865
(R.) dorsalis, 870
(Microhelea) eriophora, 571
erucicida, 569
(S.) *floridensis*, 195
(Thyridomyia) frutetorum, 180
fuliginosa, related to Forcipomyia (Microhelea), 564
(M.) galapagensis, 572
genualis, 569
(*R.*) guamai, 869
hirta, 183
(M.) insignipalpis, 573
(T.) johannseni, 182
knockensis, 193
(M.) *luteisquamosa*, 575
(R.) messersmithi, 864
(M.) microtoma, 575
(M.) *minisquamosa*, 570
moascari, 197
(T.) monilicornis, 183
(S.) murina, 197
(T.) nodosa, 186
(M.) *penultimata*, 573
(R.) puracensis, 867
(T.) rugosa, 187
(T.) *sinuosa*, 189
(M.) squamosa, 569
(T.) *tenuichela*, 191
(S.) tenuiforceps, 199
(R.) zeteki, 870
Forest tent caterpillar, life table, 25
Formica exsectoides, 766
Fossil bee fly, new species, 1421
Frankliniella occidentalis, 414
Fraxinus americanus, 807
pennsylvanica, 807
sp., 807
Fumidil-B[1] to reduce microsporidian disease in boll weevil, 942
Fungi, Acarus siro attraction by, 1069
on gypsy moth egg clusters, 1417

G

Galleria mellonella, 90, 762
fatty acids in, 1020
Gamma-irradiated house fly, damage in tissues, 504
Gamma irradiation: effects on Plodia testes and mating, 1144
mortality of alfalfa weevil pupae from, 1331
Gampsochoris pulchellus, 814
Geocoris atricolor, 812
pallens, 812
punctipes, 812
punctipes, mating behavior, 764
punctipes, rearing on diets, 892
German cockroach, rearing, 641
Gibberellic acid, none in royal jelly, 989
Gibbium psylloides, egg hatch, 1237
Gillettiella atropunctata, 170
Glossina morsitans, 405
Glypta fumiferanae, 86
Grain mite attraction by fungi, 1069
Graminella mohri, 171
nigrifrons, 1150
nigripennis, 929
sp., 1153
Graphocaecilius, 1361
interpretatus, 1363
Graphosoma italicum, 816
Grasshoppers, acoustic communication in biology of two species, 17
bionomics, 310
induced color dimorphisms in, 1154
Grassland leafhoppers, 166
Greenbug, and plant resistance and parasitism, 650
sexuality, 671
Gromphadorhina portentosa, 891
Ground beetle, defense against males, 513
defensive chemistry, 275
identification of larvae, 1349
seed-caching by, 1426
Growth, and retrogression in Trogoderma glabrum larvae, 1319
Growth of: Aedes in saline solutions, 1425
Indian meal moth, 1084
Gryllodes sigillatus, 282
Gryllotalpa gryllotalpa, 980
Gryllus sp. near personatus, 1431
Guar, midge association with, 1203
Gulf Coast tick, muscles, 61
Gymnogryllus humeralis, 282
minor, 282
Gyponana sp., 170
Gypsy moth, diel periodicities, 1126
egg mass and parasitization by Ooencyrtus kuwanai, 64
fungus on egg clusters, 1417
responses to colored surfaces, 742
Gyrohyphus obsidianus, 1334

H

Habits of solitary female Ips, 1293
Haematobia irritans, physiological development, 695
Halys dentata, 816
  neelgiriensis, 816
Hapsiphlebia, 1401
  anastomosis, 1401
  sp., 1401
Harpalus herbivagus, 1350
Harpalus pensylvanicus and H. erraticus, seed-caching by larvae, 1426
Hebecephalus rostratus, 171
Hecalinae, 167
Helicobia rapax, 318
Heliophana mitis, 1280
Heliothis spp., 760, 767
  parasitism in cotton fields, 759
Heliothis virescens, 230, 759, 901
  histology of eye, 767
  UV sensitivity, 701
Heliothis zea, 603, 759, 767, 821, 892, 919
  UV sensitivity, 701
Heliozella aesella, 1217
Hemiptera, 54, 96, 303, 474, 622, 625, 629, 650, 740, 762, 764, 840, 896, 906, 929, 985, 1131, 1149, 1242, 1258, 1270, 1283
Heraeus cinnamomeus, 812
  eximus, 812
  plebejus, 812
Hessian fly control, 750
Heterocampa manteo, 765
Heterolaccus hunteri, 1219
Heteroptera, 892, 1240
  (Hemiptera) scent-gland development in, 810
Heydenia unica, response to Dendroctonus frontalis, 31
Hippelates bishoppi, age-related changes in, 1092
  pallipes, age-related changes in, 1092
  pusio, age-related changes in, 1092
Hippodamia convergens, 835
  parenthesis, 836
Hirilcus alternatus, 814
Hister abbreviatus, 1334
  americanus, 1334
Histochemistry of insect eggs, 519
Histology of: Dioryctria abietella, 1208
  Heliothis virescens eye, 767
  Schizaphis graminum, 622
  selected systems of Phyllophaga auxia, 1026
Histopathology of irradiated yellow mealworm, 950
Holomastigotoides hartmanni, 1001
Homaemus aenifrons, 816
Homoeocerus unipunctatus, 815
Homoeosoma electellum, 1161
Homoptera, 38, 157, 166, 221, 443, 478, 648, 671, 710, 797, 804, 912, 925, 961, 1011, 1061, 1114, 1328
Honey bee, adaptation of queens, 825
  alarm pheromone, 1430
  passage of spores from, 899
  proline in royal jelly, 1236
  proteins of, 516
  queen finding by, 440
  questionable superiority of pollen in diet, 270
  rhythms, 1073
  sugar preferences of, 857
Horn fly physiological development, 695
Host(s), on Monoctonus paulensis, 422
Host discrimination: and braconid venom, 90
  in Orgilus lepidus, 375, 377
Host-parasitoid interaction of Aphis helianthi, 38
Host preferences of Acalymma vittatum, 372
Host-seeking stimulant for Trichogramma evanescens, 1087
Host selection by Perilitus coccinellae, 834
House fly, abdominal nerves, 689
  damage in tissues, 504
  X-rays and, 594
Hyadaphis pseudobrassicae, 834
Hyalomyodes triangulifer, 347
Hyalophora euphorbiae, 557
Hyalopterus pruni, 158, 361
Hybomitra lasiophthalma, 639
Hybridization and Callosobruchus maculatus, 1241
Hydrellia, 270
Hylaeus cressoni, 274
Hylastes nigrinus, 550
Hylemya brassicae, 151
Hylobius pales, 269
Hymenarcys crassa, biology, 474
Hymenoptera, 31, 33, 38, 41, 57, 64, 90, 105, 135, 172, 274, 280, 323, 358, 375, 377, 383, 419, 422, 440, 516, 547, 760, 773, 825, 834, 852, 857, 899, 977, 988, 1023, 1053, 1073, 1087, 1104, 1119, 1236, 1239, 1286, 1424, 1430
Hypera brunneipennis, fall movement, 769
  postica, 319, 979, 1331
  postica, biology and ecology, 336
  postica, diapause in parasites of, 105
Hyperglycemic agent in Periplaneta americana, 299
Hyssopus thymus, brood size, 280

I

Iassinae, 170
Ichneumon pulcherior, 309
Identity of Prociphilus (Pulvius) probosceus, 804
Idiostolus insularis, 814
Imblatella impar, 891
Imported fire ant: feeding on Paspalum seeds, 988
  nutrient content, 135
Indian meal moth, gamma radiation effects on, 1144
  growth and development, 1084
Inhibition of Apanteles congregatus by nicotine, 547
Insemination of: Aculus cornutus, 1080
  Aedes vexans by induced copulation, 293
Interspecific attraction in Lepidoptera, 1279
Introduced pine sawfly, abdominal glands, 33
Iolina nana, 795
Iolinid mite, new, 793
Iphita limbata, 814
Ips avulsus, 483
  calligraphus, 309, 483
  grandicollis, 483
  grandicollis, habits of solitary, 1293
  pini, 309
  spp., bluestain fungus effect on, 481
Ischnodemus brincki, 813
  diplachne, 813
  falicus, 813
Ischnoptera rufa rufa, 891
Ischnorhynchus resedae, 812
iso-Butyric acid, identification, 1240
Isoptera, 226, 457, 655, 686, 756, 984, 1001
Itoplectis conquisitor, 87, 991
  quadricingulatus, 173
  quadricingulatus and Apechthis ontario interaction, 172
Ixodoidea, 746

J

Jack pine budworm, population fluctuations, 82
Jalysus balli, 814
  spinosus, predation of Manduca sexta by, 896
Jumping spider, bionomics, 602
Juncus effusus, 1328

K

Kaestneriella, 1363
Keonella dolobrata, 170
Keyboard for recording insect behavior, 278
Kolenetrus plenus, 812

L

Labops hesperius, 272
  sp., 1193
Lachesilla, 1363
Laetilia sp., 987

Laevicephalus, review of genus, 929
Laevicephalus acus, 931
aridus, 936
aurarius, 936
austrinus, 929
bison, 935
bocanus, 929
canyonensis, 936
colladonus, 937
curvus, 939
exiguus, 935
harrisi, 939
inconditus, 940
longus, 936
melsheimeri, 931
mexicanus, 939
minimus, 171, 940
monticola, 937
obvius, 935
omani, 936
opalinus, 940
parvulus, 171, 935
parvulus hamatus, 936
paulus, 936
peronatus, 933
perpusillus, 934
poudris, 935
pravus, 931
salarius, 936
sp. prob. tantalus, 171
sylvestris, 932
tantalus, 935
tritus, 938
unicoloratus, 797, 934
ustulatus, 938
vafer, 934
vannus, 935
verberatus, 939
Lambdina fiscellaria lugubrosa, 173
Lamiinae, stridulatory apparatus, 644
Lamproblatta albipalpus, 891
Lampromicta senator, 816
Largus rufipes, 814
Larval mine characteristics of leaf-mining Lepidoptera, 74
Lasioderma serricorne, biology, 447
Laspeyresia pomonella, 93
Latalus hultus, 929
Latiblattella angustifrons, 891
azteca, 891
vitrea, 891
Leaf-mining Lepidoptera in pecan, 74
Leafhopper genus, review, 929
Leafroller, biology, 1415
Ledrinae, 167
Lepidoptera, 25, 93, 100, 119, 238, 296, 306, 367, 433, 436, 450, 513, 658, 701, 742, 759, 763, 767, 821, 882, 896, 898, 901, 918, 958, 976, 1016, 1020, 1058, 1084, 1124, 1126, 1144, 1161, 1185, 1208, 1224, 1232, 1267, 1296, 1337, 1346, 1356, 1415
Lepidoptera, interspecific attraction in, 1279
leaf-mining, in pecan, 74
sex pheromones, 954
Leptocera, taxonomic notes on Holarctic, 1245
caenosa, 1246
ferruginata, 1248
fontinalis, 1245
hoplites, 1246
limosa, 1251
lutosa, 1250
lutosoidea, 1256
pararoralis, 1246
sp., 1431
Leptocorisa acuta, 814
Leptoglossus australis, 815
occidentalis, 815
zonatus, 815
Leptophlebiidae, revision of generic classification, 1398
Leschenaultia exul, 29
Lethal effects of radiofrequency energy on Tenebrio molitor eggs, 807
Leucocytozoon simondi, role of black flies in transmission, 842
Leucophaea maderae, 891
Life cycle of sunflower moth, 1161
Life history of: Archips negundanus, 1416
Corimelaena i. lateralis, 906
Propylea 14-punctata, 648
Pseudanthonomus krameriae, 619
sorghum shoot fly, 586
Life tables for forest tent caterpillar, 25
Ligyrocoris diffusus, 812
piligerus, 812
sylvestris, 812
Lilac leaves and cecropia moths, 367
Limotettix striolus, 171
Liposcelis bostrychophilus, 533
Lissorhoptrus oryzophilys, biology, 990
Lithocolletis caryaealbella, 74
caryaefoliella, 74
Locustacarus, 1100
Lonatura pupa, 929
Lone star tick, blood infestion, 1065
Longistigma caryae, 158
Longitarsus jacobaeae to control tansy ragwort, 406
Lopidea *medleri*, 841
Low kilovoltage radiography, 1232
Lucilia illustris, 1345
Lutzomyia gomezi, 683
longipalpis, 684
sanguinaria, 683
trinidadensis, colonization, 683
vespertilionis, colonization 683
Lycosid spiders, temperature preferences, 111
Lygaeospilus tripunctatus, 813
Lygaeus bicrucis, 629
kalmii, 813
Lygus atriflavus, 629
elisus, 1431
hesperus, 893
hesperus, Nabis alternatus predator of, 625
Lyramorpha rosea, 816
Lysiphlebus, 777
sp., 426
testaceipes, 650
testaceipes on sunflowers, 38

M

Macropeza neotropicalis, 1369
Macrosiphum, 159
californicum, 426
euphorbiae, 158, 426, 774
Macrostelus fascifrons, 171
Maculation pattern in Protesilaus, 1346
Madasumma varipennis, 282
Maevius indecorus, 814
Maize weevil, parasite development on, 852
Malacosoma disstria, 25
Malezonotus fuscosus, 812
Mallophaga, 487, 771, 1182
Malpighian tubule muscle of American cockroach, 614
Man, myiasis in, 514
Manduca quinquemaculata, 779
sexta, 547, 779, 1185
sexta, egg defenses against Jalysus spinosus, 896
Manure, Coleoptera succession in bovine, 1333
Margus inconspicuous, 815
Marking insects with rubidium, 236
Mascaropsocus, 1363
Masonaphis grindeliae, 426
Massartella, 1404
alegrettae, 1404
brieni, 1404
fruhstorfferi, 1404
spp., 1404
Massartellopsis, 1409
irarrazavali, 1409
Mating behavior of: European corn borer, 1016
Trogoderma inclusum, 791
Mating refractory period in Trogoderma inclusum, 790
Matsucoccus resinosae, 1061
Mayetiola destructor, 750
Mcateella, 1259
Meadow spittlebug, polymorphism, 710
Mecidea major, 816
minor, 816
Mecoptera, 1302
Medetera aldrichii, oviposition, 328
Mediterranean fruit fly, artificial infestation of citrus fruits with, 1238
Megachile rotundata, fat body inclusions, 1286
Megalonotus chiragrus, 1193
Megaloptera, 109
Megalotomus quinquespinosus, 814
Megoblatta blaberoides, 891
Melamphus fulvomarginatus, 814
Melanagromyza splendida, 630
Melanopleurus bicolor, 813
Melanoplus differentialis, 3
plant extract effect on, 662
femurrubrum, 662
femurrubrum, S&D factor from plant extracts, 1005
sanguinipes, plant extract effect on, 662

sanguinipes, S&D factor from plant extracts, 1005
Melanotelus villosulus, 813
Melaphis rhois, 158
Membracidae, electrophoretic study, 1149
Memnonia consobrina, 167
Menopon petulans, 490
Meridialaris, 1405
biobionica, 1405
chiloeense, 1405
diguillina, 1405
illapeli, 1405
laminata, 1405
patagonica, 1405
penai, 1405
spp., 1405
Merocoris distinctus, 814
Metaphidippus galathea, bionomics, 602
Meteorus arizonensis, 760
Metopolophium dirhodum, 426
Mexican bean beetle, host preferences, 675
Microbes and ambrosia beetles, 598
Microcrambus elegans, 241
Microctonus aethiops, 347
spp., 347
Microdon baliopterus, 977
in Monomorium nests, 977
Micropletis croceipes, 760
Microporus obliquus, 1193
Microrespirometer, 705
Microscopy of Diabrotica eggshell, 1188
Microsporidian disease in boll weevil, reducing, 942
Midges associated with guar, 1203
Miespa, 1259
Minimizing ant handling in behavioral research, 1428
Miridae, new species of, 840
Mite, new genus and species, 1099
Mocuellus caprillus, 171
Modicogryllus confirmatus, 282
Mole cricket, acoustic isolation in speciation, 980
Molypteryx fuliginosa, 815
Mompha sp., 1104
stellata, 1104
Monellia caryella, 164
costalis, 158
Monochamus titillator, 644
Monoctonus crepidis, 774
paulensis, behavior and biology, 773
paulensis, hosts on, 422
Monomorium, Microdon in nests, 977
minimum, 362, 977
Monteithocoris hirsutus, 814
Morphology of: cereal leaf beetle, 945
Dioryctria abietella, 1208
Sarcophaga tibialis, 400
tymbal organ of beet leafhopper, 221
Mortality of alfalfa weevil pupae from gamma irradiation, 1331
Mosquitoes, competition in, 915
fine structure of diverticula, 962
proboscis cleaning in, 1299
sexual behavior, 267, 284, 290, 848
Mozena arizonensis, 815
rufescens, 815
Murgantia histrionica, 816
Musca autumnalis, 1342
sense organs on ovipositor, 577
sex pheromone and behavior, 607
Musca domestica, 255, 504, 594, 689, 981, 1340
Nasonia vitripennis response to, 323
Muscidae, 270
Muscidifurax raptor, 255
Muscina assimilis, 1342
stabulans, 1342
Muscles of Amblyomma maculatum, 61
Mustha spinosula, 816
Mutant cereal leaf beetle, 558
Mycetobia divergens, 357
Myiasis by Cuterebra, 514
Myodocha serripes, 812
Myzus ornatus, 426
paulensis, 423
persicae, 426, 774, 834, 912

N

Nabis alternatus, biology, 54
predator of Lygus hesperus, 625
NaCl, effects on Chironomus attenuatus, 872
Nantucket pine tip moth, head capsules, 513
shortleaf pine conelet loss by, 100
Nasonia vitripennis, flagellar sense receptors, 1119
responses to Musca domestica, 323
Nauphoeta cinerea, 891
Neacanthocinus obsoletus, 644
Nearctic species of Thyridomyia and Synthyridomyia, 177
Necremnus sp., 1219
Nemobius carolinus neo-mexicanus, 1431
Nemorilla maculosa, 1345
Neoblatta sp., 891
Neocoryphus bicrucis, 813
lateralis, 813
Neoparacletus caricis, 1328
corrugatans, redescription and biology, 1328
Neophyllaphis podocarpi, 157
Neostylopyga rhombifolia, 891
Neotropical Forcipomyia (Microhelea) and F. fuliginosa, 564
Nepticula juglandifoliella, 74
Neral and geranial, identification in colletid bee, 274
Neustonic insects, floating adhesive trap for, 269
Nicotene, inhibition of Apanteles emergence by, 547
toxicity to tobacco hornworm larvae, 1185
Noctuid cutworms, diel periodicities, 1126
moths, sex pheromones of, 436
Noliphus annulipes, 814
Nomia melanderi, 1286
Norbanus sp., 755
Northern walkingstick, abundance, 876
Nosodendron unicolor, 357
Notice: of annual meeting, 975
to contributors, 754
Notiphila, 270
Notobitus sp., 815
Notonecta undulata predation on Culex tarsalis, 1270
Nousia, 1412
Nuclear polyhedrosis of Pseudaletia separata, 763
Nutrient content of fire ant, 135
Nysius raphanus, 813
tenellus, 813

O

Oak, red oak borer emergence from, 1243
woodpecker predation of red oak borer in, 1421
Oberea brevis, parasites, 755
schaumii, biology, 114
Ochlerotatus, subg., 124
Ochrotrichia, list of species, 142
review, 141
Ochrotrichia *alexanderi*, 145
alsea, 143
argentea, 150
arizonica, 145
buccata, 149
chiapa, 147
dactylophora, 143
hadria, 143
ildria, 145
logana, 142
lometa, 142
lucia, 147
nacora, 145
quadrispina, 150
rothi, 149
spinulata, 149
stylata, 143
tarsalis, 143
vertreesi, 149
zioni, 143
Ochthera, 270
Odinia sp. nr. meijerei, 357
Oedancala dorsalis, 812
Oedipoda coerulans, 24
Olfactory discrimination in moths, 1337
Oligomyrmex sauteri, 1024
Olla abdominalis, 1431
Ommatidia of scolytid beetles, 550
Omnivorous leafroller, sex pheromone, 958
Oncopeltus fasciatus, 813
sanguineolentus, 813
Ontholestes cingulatus, 1334

Onthophagus hecate, 1334
pennsylvanicus, 1334
Ontogeny of blister beetles, 1
Ooencyrtus kuwanai, 743, 1126, 1417
parasitization of gypsy moth by, 64
Ophyra aenescens, 1342
leucostoma, 1342
Orgilus lepidus, host discrimination of, 375, 377
Orius tristicolor, biology, 96
Ornithodorinae, systematics, 730
Ornithodoros, 731
(Alectorobius), 731
(Pavlovskyella), 731
(Subparmatus), 731
Ornithodoros (A.) azteci, 731
(A.) boliviensis, 732
(A.) brodyi, 731
(A.) capensis, 732
(A.) *casebeeri*, 733
(A.) *chironectes*, 732
(A.) *clarki*, 734
(A.) concanensis, 732
(Ornamentum) coriaceus, 731
(A.) denmarki, 732
(A.) dusbabeki, 732
(A.) dyeri, 731
(A.) echimys, 732
elongatus, 732
(A.) eptesicus, 732
(P.) hermsi, 731
(A.) kelleyi, 732
(A.) *knoxjonesi*, 735
lagophilus, 731
magnini, 731
(S.) marinkellei, 731
(A.) *marmosae*, 736
(A.) mimon, 732
(S.) mormoops, 731
nalalinus, 732
(P.) nicollei, 731
(P.) parkeri, 731
(A.) peropteryx, 731
(A.) peruvianus, 732
(A.) puertoricensis, 732
(A.) rossi, 731
(P.) rostratus, 731
rudis, 732
(A.) setosus, 731
sparnus, 832
(A.) stageri, 732
(A.) talaje, 732
(A.) *tiptoni*, 738
(P.) turicata, 731
(A.) *tuttlei*, 738
(S.) viguerasi, 731
(A.) yumatensis, 731
Orocastus aridus, 930
aurarius, 929
omani, 929
perpusillus, 930
Ortholomus scolopax, 813
Orthoptera, 17, 216, 282, 299, 310, 460, 641, 662, 876, 980, 1005, 1154, 1417
Ostrinia nubilalis, 433, 450, 658, 1337
mating behavior, 1016
Otobius, 731
Oulema melanopus, 558, 945
Ovacarus, 1100
Ovarial development of insects, dissection to determine, 271
Overcrowding of bean leaf roller, 1124
Oviposition: by parasite abdomen, 991
of alfalfa weevil, 979
of Medetera aldrichii, 328
Oxpoda sagulata, 1334
Oxytelus suspectus, 1334
Ozophora picturata, 812

P

^{32}P technique for estimating Pogonomyrmex colonies, 57
Pachybrachius albocinctus, 812
bilobatus, 812
vinctus, 812
Pachycolpura manca, 815
Pachylobius picivorus, 269
Panchlora, 522
cubensis, 522
nivea, 522, 891
stanleyi, 521
Panchlorinae, cockroaches of, 521
Panonychus citri, 69
Panorpa annexa, 1303
germanica, 1303
nuptialis, spermatozoa of, 1302
Papaipema nebris var. nitella, 1104
Papilio agesilaus fortis, wing pattern, 1346
glaucus, color morphs, 1267
Parabolocratus brunneus, 167
curtus, 167
flavidus, 797
grandis, 167
viridis, 167
Paralimna, 270
Paraphlepsius altus, 171
irroratus, 171
Paraplesius unicolor, 814
Paraseriola spp., 759
Parasite abdomen, oviposition by, 991
interaction, 172, 323
of Oberea brevis, 755
Parasitism of Heliothis spp. in cotton fields, 759
Parasitization of gypsy moth by Ooencyrtus kuwanai, 64
Parasitoids of synanthropic flies, 254
Paratrechina longicornis, 1024
Parcoblatta americana, 891
pennsylvanica, 891
Pardosa sierra and P. ramulosa, temperature preferences, 111
Parental age and egg hatch in Triatoma, 740
Paridesmia discus, flagellar sense receptors, 1119
Paromius longulus, 812
Paron aquti, 426
Paryphoconus aemulus, 1371
amapaensis, 1371
angustipennis, 1371
anomalicornis, 1372
barrettoi, 1373
batesi, 1369
enderleini, 1369
fuscus, 1369
goianensis, 1369
grandis, 1369
guianae, 1377
kiefferi, 1369
lanei, 1374
macfiei, 1369
mayeri, 1369
neotropicalis, 1369
nigripes, 1369
nubifer, 1374
oliveirai, 1374
paulistensis, 1369
sonorensis, 1374
subflavus, 1376
terminalis, 1377
travassosi, 1378
unimaculatus, 1369
wirthi, 1369
wygodzinskyi, 1369
Pasimachus elongatus, defensive scent fluid, 772
Paspalum, imported fire ant feeding on seeds, 988
Patelloa pachypyga, 29
silvatica, 1345
Pauesia, 777
Pavement ant, biology, 358
Pea aphid, bean yellow mosaic virus transmission by, 912
population growth, 1011
Pea enation mosaic virus, vectors of 1114
Pecan, leaf-mining Lepidoptera in, 74
Pectinophora gossypiella, 281
Pediasia caliginosella, 241
luteolella, 241
mutabilis, 241
trisecta, 239
Pelloblatta, 527
lata, 528
reyesi, 528
Peltocopta crassivenstris, 816
Penaphlebia, 1399
chilensis, 1399
fulvipes, 1399
sepia, 1399
spp., 1399
vinosa, 1399
Penicillium camemberti, 1071
cyclopium, 1071
notatum, 1071
roqueforti, 1071
Peridesmia discus, 105, 347
Perigenes constrictus, 812
Perilampus fulvicornis, 759
hyalinus, 760
Perilitus coccinellae, host selection by, 834
Periplaneta americana, 399, 891
hyperglycemic agent in serum, 299
malpighian tubule muscle, 614
Periplaneta australasiae, 891
brunnea, 891
fuliginosa, 891
Periscelis flinti, 357
Peritrechus fraternus, 812
Phaenicia coeruleiviridis, 1345
pallescens, 1345
sericata, 323, 1340
Phaeoura mexicanaria, biology, 306
Phelister subrotundus, 1334

Phenology of flesh fly diapause, 410
Pheromone release in southern pine beetle, 263
Pheromones, tests of, 1227
Philaenus spumarius, 714
  polymorphism, 710
  var. albomaculatus, 711
  var. bimaculatus, 714
  var. dimidiatus, 714
  var. dubius, 714
  var. fasciatus, 711
  var. gibbus, 711
  var. graminis, 712
  var. hafniensis, 712
  var. holosericeus, 715
  var. impressifrons, 715
  var. impressus, 712
  var. intricatus, 715
  var. lateralis, 711
  var. leucocephalus, 712
  var. leucophthalmus, 712
  var. marginellus, 712
  var. oentherae, 716
  var. populellus, 712
  var. populi, 712
  var. praeustus, 716
  var. quadrimaculatus, 716
  var. quadripunctatus, 716
  var. retowskii, 717
  var. refescens, 717
  var. trilineatus, 712
  var. typicus, 712
  var. ustulatus, 717
  var. virescens, 717
  var. vittatus, 712
  var. xanthocephalus, 717
Philonthus cruentatus, 1334
  rectangularis, 1334
  sp., 1431
  umbrinus, 1334
  varians, 1334
Phlegyas abbreviatus, 812
Phlegethontius sextus jamaicensis, 572
Phthorimaea glochinella, 1104
  operculella, 281, 375, 377, 893, 1104
Phyllomorpha sp., 815
Phyllophaga auxia, anatomy and histology of, 1026
  spp., 1047
Phormia regina, 1342
Phortioeca phoraspoides, 891
Photography, fluorescence in feeding evaluation by phytophagous insects, 277
Photophase and European corn borers, 433
Physiological: development of horn fly, 695
  effects of NaCl on Chironomus attenuatus, 872
Phytomyza syngenesiae, 630
Pieris brassicae, 557
  rapae, 762
Piesmatinae, claudistic analysis of, 1258
Pine bolts, bluestain fungus effect on Ips spp. in, 481
  looper, biology, 306
  sawfly, seed dockage sieves for sex-separation of cocoons, 1424
Pines, pine seedling weevils attracted to, 269
Pink bollworm, calling behavior, 281
Pinus sylvestris, Tresetacus *campnodus* attacking, 46
Pinyon spindle gall midge, biology, 331
Pinyonia edulicola, 331
  emergence from Sitka spruce, 1423
Pissodes strobi, stridulatory mechanisms, 1076
Plant-extract: concentrations and fractions, and Melanoplus spp., 1005
  effect on Melanoplus, 662
Plant resistance, parasitism, and greenbugs, 650
Plapigus circumcinctus, 815
Plaques on antennae of muscoid Diptera, 1340
Platygaster sp., 331
Platynota stultana, sex pheromone, 958
Platysamia cecropia, energy, 367
Platystethus americanus, 1334
Plebeiogryllus guttiventris, rearing, 282
Plecopteracoluthus downesi, commensalistic relationship with Chauliodes, 109
Plectrodera scalator, 644
Plesiopsothrips, 50
Plesiothrips, 50
  andropogoni, 54
  perplexus, 54
Plinachtus bicolor, 815
Plinthisus compactus, 812
  longisetosus, 812
Plodia interpunctella, 90, 898, 1280, 1356
  carbon dioxide effect on eggs, 976
  gamma radiation effects on, 1144
  growth and development, 1084
Podapolipoides, 1100
Podapolipus, 1100
Podisus maculiventris, 816
  placidus, 318
Pogonomyrmex californicus, 57
  colonies, population estimates, 57
Polistes, 789
Pollen: grains in tabanid guts, 1264
  in honey bee diet, questionable superiority, 270
Pollenia rudis, 1345
Polyamia caperata, 797
  satur, 171
Polygraphus, 553
Polymorphism of meadow spittlebug, 710
Polyrhachis dives, 1025
  hippomanes, 1025
  lamellidens, 1025
  rastellata, 1025
  simplex, 1025
Population: dynamics of American dog tick, 1164
  estimates of Pogonomyrmex, 57
  fluctuations of jack pine budworm, 82
Population growth of: Drosophila melanogaster, 993
  pea aphid, 1011
Populus tremuloides, Oberea schaumii in, 114
  Saperda inronata in, 127
Porricondyla sp., 1207
Porthetria dispar, 64, 742, 1126, 1417
Potato tuberworm, biology of parasite of, 1104
Prairiana sp., 170
Praon, 778
  gallicum introduced on sunflowers, 38
Predation of Notonecta on Culex, 1270
Priocnemicornis flaviceps, 815
Prionoxystus robiniae, 1058
  emergence behavior, 1296
Pristomerus spp., 760
Proboscis cleaning in mosquitoes, 1299
Procellariphaga daptionis, 494
Prociphilus a. alnifoliae, 1328
  alnifoliae fitchi, 1328
  approximatus, 804
  erigeronensis, 1330
  (Pulvius) prosoceus, identity, 804
Prolean in royal jelly, 1236
Pronotocantha annulata, 814
Propylea 14-punctata, biology and life history, 648
Proteins of honey bees, 516
Protenor belfragei, 814
Protesilaus, maculation pattern, 1346
Protophormia terrae-novae, 405, 1342
Psammotettix alienus, 171
Pseudaletia separata, nuclear polyhedrosis of, 763
  unipunctata, 983, 1224
Pseudanthonomus krameriae, life history, 619
Pseudatomascelis seriatus, 759
Pseudocnemodus canadensis, 812
Pseudolasius sp., nr emeryi, 1024
Pseudopamera nitidula, 812
Pseudotrichonympha grassii, 1001
Psocid, anobiid beetle eggs consumed by, 533
Psocoptera, 533, 1359
Pteridothrips, 50
Pterostichus lucublandus, defense against males, 513
Ptochiomera nodosa, 812
Pycnoscelus indicus, 891
  surinamensis, 891
Pyrellia cyanicolor, 1342
Pyrrhocoris apterus, 814
Pyrsonympha, 756

Q

Queen finding by swarming honey bees, 440

R

Rabdomorphus australis, 813
Radiation dosage and interaction of age, 1237

Radiofrequency energy, lethal effects on Tenebrio molitor eggs, 807
Radiographic studies of Choetospila elegans, 852
Radiography, low kilovoltage, 1232
Raisin moth, sex pheromone from, 1356
Rearing: and marking Culex, 267
German cockroaches, 641
Plebeiogryllus guttiventris, 282
Stethaulax marmoratus, 1242
Trichopepla semivittata on wild carrot, 985
Recording electromyograms from flying moths, 982
Red flour beetle, thermal perception, 1388
Red imported fire ant, colony founding, 1053
Red oak borer, emergence from oak, 1243
Red oak borer, woodpecker predation on, 1421
Redescription and biology of Neoparacletus corrugatans, 1328
Redwood, extractives and eastern subterranean termite, 686
Reprint charges, revised, 754
Reproduction of: alfalfa weevils, 319
Geocoris punctipes, 892
Reproductive systems of cereal leaf beetle, 945
Resistance: of barley to greenbug, 961
to desiccation in Aedes, 542
Resistant corn leaf tissue influence on biology of European corn borer, 658
Respiration rhythms in codling moth larvae, 93
Respiratory activity in Cephus cinctus, 419
Responses of: gypsy moths to colored surfaces, 742
Heydenia unica to Dendroctonus frontalis, 31
Reticulitermes flavipes, 226
fatty acids of, 655
feeding, 457
survival on woods, 686, 984
Reticulitermes virginicus, feeding of, 756
Revision of: generic classification of Leptophlebiidae, 1398
Stenoxenini, 1368
Rhodnius prolixus and iso-Butyric acid, 1240
Rhopalosiphum maidis, 303
comparisons of Schizaphis graminum biotypes with, 925
padi, 426
padi, comparisons of Schizaphis graminum biotypes with, 925
Rhyacionia buoliana, sex pheromone bioassay for, 119
frustrana, 513
frustrana, cause of shortleaf pine conelet loss, 100
Rhynchoforcipomyia, new subgenus, 862
Rhyopsocus phillipsea, 533
Rhyparochromus californicus, 1193
Rhythms of honey bees, 1073
Rhyticoris spinipes, 815
Rice water weevil, biology, 990
Rioxa suspensa, 1367
Riptortus clavatus, 814
Robber flies, fossil, 275
Royal jelly, no gibberellic acid in, 989
proline in, 1236
Rubidium, marking insects with, 236
Ruckesona vitrella, 815

S

Saissetia miranda, pest of citrus, 478
neglecta, 479
oleae, 479
Saline solutions, growth of Aedes in, 1425
Saperda inornata, 114
biology in trembling aspen, 127
Sarcophaga aldrichi, 29, 1345
bullata, 1345
bullata, diapause phenology in, 410
tibialis, biology and morphology, 400
tibialis, water and fat content, 396
Savius dilectus, 815
Scale-pheromone producing organ, site, 1283
Scantius aegypticus, 814
Scaphytoplus cinereus, 171
Scaptocoris minor, 815
Scarabaeidae, 271
Scatophaga furcata, 1342
Scent-gland development in Heteroptera, 810
Schistocerca gregaria, tepa effects on, 216
sp., 793
Schizaphis graminum, 38, 650, 961
comparisons of biotypes, 925
embryology and histology, 622
sexuality, 671
Schizura leptinoides, 765
Sciocoris cursitans, 816
fuscoparsus, 816
Scolopstethus pacificus, 812
thomsoni, 812
Scolytid beetles, ommatidia of, 550
Scolytus multistriatus, 757
Scopulariopsis brevicaulis, 1070
Scorpionfly, spermatozoa of, 1302
Scotch pine, new Trisetacus from, 1089
Scutelleroidea on wild carrot, 906
Scutiphara pedicellata, 816
^{75}Se in aphid feeding studies, 303
Seasonal abundance of Winthemia manducae, 779
Seed caching by ground beetles, 1426
Seed dockage sieves for sex-separation of pine sawfly cocoons, 1424
Segestria bavarica, 1316
Sehirus albonotatus cinctus, 815
Senecio jacobaea, insects feeding on, 629
Senoprosopis *beckeri*, 276
Sense organs of: cabbage looper antennae, 296
Cheiloneurus noxius, 41
face fly ovipositor, 577
Sensilla chaetica structure on antennae of Aedes aegypti, 1390
Setoptus sp., 1091
Serotinin in Drosophila, 138
Sex attractant in Anastrepha suspensa, 1364
Sex pheromone, bioassay for Rhyacionia buoliana, 119
from raisin moth, 1356
studies with omnivorous leafroller, 958
Sex pheromone of: beet armyworm, 898
carpenterworm, 1058
face fly, 607
Lepidoptera, 954
noctuid moths, 436
yellow scale, 443, 1061
Sexius virescens, 222
Sexual behavior of mosquitoes, 848
Sexuality of greenbug, 671
Shawella couloniana, 891
Sheep biting louse, biology, 1182
Shortleaf pine conelet loss by Nantucket pine tip moth, 100
Simulium euryadiminiculum, 842
innocens, 842
rugglesi, 842
Sipha flava, comparisons of Schizaphis graminum biotypes with, 925
Site of scale-pheromone producing organ, 1283
Sitka spruce, Pissodes strobi emergence from, 1423
Sitobion fragariae, 424, 774
Sitophilus granarius, 271
zeamaize, parasite development on, 852
Small grains, resistance to greenbug, 961
Smaller European elm bark beetle, Dendrosoter protuberans on, 757
Sod webworm, chorion and eggs of, 238
Solenopsis invicta, 988
colony founding, 1053
Solenopsis molesta, 362
saevissima, 988
saevissima richteri, 135
Solubea pugnax, 816
Sorghum, greenbug resistance on, 650
Sorghum shoot fly, life history, 586
Sorhoanus spicatus, 171
Southern pine beetle, pheromone release in, 263
Southwestern corn borer, diapause, 882
Soybeans, feeding of insects associated with, 675

Spalangia cameroni, 255
endius, 255
Spanish moss, Aclerda from, 1261
Spathophora biclavata, 814
Spatial patterns of bean leaf roller, 1124
Spermatozoa of scorpionfly, 1302
Sphaeridium acarabaeoides, 1335
bipustulatum, 1334
lunatum, 1334
scarabaeoides, 1334
Sphaerocoris testudogrisea, 816
Sphragisticus nebulosus, 1193
Spintherus sp., 105
Spirotrichonympha leidyi, 1001
Spodoptera exigua, 1280
sex pheromone of, 898
Spodoptera frugiperda, 1280
Spotted alfalfa aphid, wind migration, 1131
Staluptas marginalis, 815
Stegophylla sp., 158
Stenaptula angusticollis, 813
Stenocoris filiformis, 814
furcifera, 814
Stenomacra marginella, 814
Stenoxenini, revision, 1368
Stenoxenus *arcuatus*, 1379
blantoni, 1379
brasiliensis, 1380
carrerai, 1380
coomani, 1380
dimorphus, 1380
excentricus, 1381
fulvus, 1381
insigninervis, 1380
johnsoni, 1381
lanci, 1381
limpidus, 1383
marginalis, 1385
nigrus, 1386
paraensis, 1386
setiger, 1387
stenopterus, 1387
usutae, 1387
Stethaulax marmoratus, rearing 1242
Stictocephala bubalus, 1150
Stirellus bicolor, color form of S. obtutus, 797
Stiretrus anchorago, 816
Stomoxys calcitrans, 1342
Stridulatory apparatus of Lamiinae, 644
mechanisms in white pine weevil, 1076
Strobisia iridipennella, 1104
Stygnocoris rusticus, 812
Subterranean termites, feeding and survival, 226
Sugar preferences of honey bee, 857
Sunflower, Aphis helianthi on, 38
moth, life cycle, 1161
Supella longipalpa, 891
Survival of Reticulitermes flavipes on woods, 984
Symploce capitata, 891
Synonymy of Anomopsocus and Antipsocus, 1359
Synthyridomyia, Nearctic species of, 177
Syrbula admirabilis, color dimorphisms in, 1154
Systematics of Onithoderinae, 730

T

Tabanidae, notes on, 637
Tabanids, pollen grains in guts, 1264
Tabanus abbreviatus, 638
albimedius, 638
amaenus, 637
attenuatus, 637
bainanensis, 638
barnesi, 639
brunnitibiatus, 637
calidus, 638
conicus, 638
dorsiger, 640
effilatus, 640
fenestratus, 637
finalis, 638
fumifer, 639
fuscicostatus. 1264
guineensis, 638
hymalayensis, 638
inscitus, 638
lentis, 638
lentisignatus, 639
lineola, 1264
l. hinellus, 1266
manilensis, 640
megalops, 640
nigrovittatus, 1266
oknos, 639
partitus, 640
pratti, 638
productus, 640
redactus, 639
rubidus, 639
rufocallosus, 640
sinicus, 639
striatus, 639, 640
tenens, 639
tetropsis, 640
triceps, 640
trimaculatus, 638
umbrosus, 638
Tansy ragwort, control, 406
insects feeding upon, 629
Tapinella prob. africana, 533
Tarsopolipus, 1100
Taxonomic notes on Leptocera, 1245
position of Anomopsocus and Antipsocus, 1359
Taxonomy of new Amplyopone species, 383
Tectocoris diophthalmus, 816
Temperature, and European corn borers, 433
effect on Cephus cinctus, 419
preferences of lycosid spiders, 111
Temperature and population growth of: Drosophila melanogaster, 993
pea aphid, 1011
Tenebrio molitor, 271, 950
RF energy effects on, 807
Tepa, effects on Schistocerca gregaria, 216
Testicular development in tobacco budworm, 901
Tests of pheromones, 1227
Tetramorium caespitum, biology, 358
Tetranychus canadensis, 70
gloveri, 69
neocaledonicus, 69
pacificus, 96
sp., 70
urticae, 69, 893, 1289
yusti, 69
Tetrapolipus, 1099
hippodamiae, 1099
rhynchophori, 1100
solanophilae, 1099
Tetraponera allaborans, 1024
Tetrastichus incertus, 347
Thaumastella aradoides, 815
namaquensis, 815
Thaumatopsis edonis, 239
Therioaphis maculata, 1131
trifolii, 426, 774
Thermal perception by red flour beetle, 1388
units and cabbage maggot populations, 151
Thyanta pallidovirens, 1431
Thyridomyia, Nearctic species of, 177
palustris, 183
Thysanoptera, 49, 414, 589
Tiger swallowtail, color morphs, 1267
Tobacco budworms, competition and host discrimination between parasitoids, 229
testicular development in, 901
Tobacco hornworm, emergence of Apanteles from, 547
nicotine toxicity to larvae, 1185
parasitization by Winthemia, 779
Topotypic Trichogramma minutum, 1239
Torania variata, 1317
Toumeyella sp., 987
Toxicity of nicotine to tobacco hornworm larvae, 1185
Trachelium sp., 814
Trap, floating adhesive, 269
Trapezonotus arenarius, 812
Trehalose in boll weevils, 554
Trembling aspen, Oberea schaumii in, 114
Saperda inornata in, 127
Triatoma phyllosoma pallidipennis, parental age and egg hatch in, 740
Tribolium castaneum, development, 631
thermal perception, 1388
confusum, 271
Trichocentrus gibbosus, 814
Trichogramma, scanning electron microscopy of wounds inflicted by, 760
evanescens, 762
evanescens, host-seeking stimulant for, 1087
fasciatum, 760
minutum, 85
minutum, topotypic, 1239
spp., 1087

Trichohelea, new subgenus of complex, 862
Trichonympha agilis, 756
Trichopepla semivittata, 911
  rearing on wild carrot, 985
Trichoplusia ni, 237, 919, 983, 1431
  releasing behavior, 436
  sense organs, 296
  sex pheromone, 954
Trichoptera, 141, 518
Trioxys, 777
  complanatus, 426
Trisecus pictus, 814
Trisetacus, new species, 1089
  alborum, 1091
  campnodus attacking Pinus sylvestris, 46
  gemmavitians, 1090
  grosmanni, 48
  pseudotsugae, 48
Tritiated tyrosine in Argas (Persicargas) arboreus, 746
Trogoderma glabrum, growth and retrogression in larvae, 1319
  inclusum, mating refractory period in, 790
Trypeta angustigena, 630
Trypodendron, 553
  lineatum, 550
  rufitarsis and primary fungus, 282
Two-spotted spider mite, behavior, 1289
Tylocerina nodosus, 644
Tympanic membrane of Noctuidae, 918
Typhlocibinae, 170

U

Ultrastructure of black carpet beetle, 247
Ultraviolet sensitivity of Heliothis, 701
Urbanus proteus, spatial patterns and overcrowding, 1124
Uric acid in boll weevils, biosynthesis, 612
Urolabidae nilgirica, 815
Uroleucon, 159
  nigrotuberculatus, 157
  spp., 161
  tissoti, 158
  verbesinae, 157

W

Water content of Sarcophaga tibialis, 396
Weevils, gall-inhabiting, of Antonomus, 1215
Western flower thrips, chalcidoid planidium on, 414
Western spruce budworm, detection of parasites by, 1232
White pine weevil, stridulatory mechanisms, 1076
Wild carrot, rearing Trichopepla semivittata on, 985
  Scytelleroidea on, 906
Wind migration of aphids, 1131
Winthemia manducae, seasonal abundance and mortality, 779
Wood hardness influence on eastern subterranean termite feeding, 457
Woodpecker predation on red oak borer, 1421
Workers of Coptotermes formosanus, defaunation, 1001

X

Xenonysius californicus, 813
Xerophloea peltata, 167
Xestoblatta immaculata, 891
Xiphomyrmex sp., 1024
X-rays and house fly, 594
Xyleborus dispar, culture, 719
  ferrugineus, amino acid composition, 598
Xyletinus peltatus, 533

Y

Yellow mealworm midguts, 950
Yellow scale, sex pheromone, 443, 1061
  site of sex-pheromone producing organ in, 1283

Z

Zelus exsanguis, 318
Zetheus electilis, 992
Zygosturmia protoparcis, 779

CORRECTION

Ann. Entomol. Soc. Am. 65(4) : 913. Table 1, columns 1 and 2, change *P. vulgaris* to *P. sativum*.

U. S. POSTAL SERVICE

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

(Act of August 12, 1970: Section 3685. Title 39, United States Code)

SEE INSTRUCTIONS ON PAGE 2 (REVERSE)

1. TITLE OF PUBLICATION
ANNALS OF THE ENTOMOLOGICAL SOCIETY OF AMERICA

2. DATE OF FILING
Sept. 1972

3. FREQUENCY OF ISSUE
Bi-monthly

4. LOCATION OF KNOWN OFFICE OF PUBLICATION *(Street, city, county, state, ZIP code) (Not printers)*
4603 Calvert Road, College Park, Maryland 20740 - Prince Georges County

5. LOCATION OF THE HEADQUARTERS OR GENERAL BUSINESS OFFICES OF THE PUBLISHERS *(Not printers)*
4603 Calvert Road, College Park, Maryland 20740

6. NAMES AND ADDRESSES OF PUBLISHER, EDITOR, AND MANAGING EDITOR

PUBLISHER *(Name and address)*
Entomological Society of America, 4603 Calvert Road, College Park, Md. 20740

EDITOR *(Name and address)*
William H. Anderson, Route 2, Snow Hill, Maryland 21863; and
~~Marshall R. Wheeler, University of Texas, Austin, Texas 78712~~

MANAGER EDITOR *(Name and address)*
Ralph W. Bunn, 4603 Calvert Road, College Park, Maryland 20740

7. OWNER *(If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given.)*

NAME	ADDRESS
Entomological Society of America	4603 Calvert Road, College Park, Md. 20740
(non-profit scientific society)	

8. KNOWN BONDHOLDERS, MORTGAGEES, AND OTHER SECURITY HOLDERS OWNING OR HOLDING 1 PERCENT OR MORE OF TOTAL AMOUNT OF BONDS, MORTGAGES OR OTHER SECURITIES *(If there are none, so state)*

NAME	ADDRESS
None	

9. FOR OPTIONAL COMPLETION BY PUBLISHERS MAILING AT THE REGULAR RATES (Section 132.121, Postal Service Manual)

39 U. S. C. 3626 provides in pertinent part: "No person who would have been entitled to mail matter under former section 4359 of this title shall mail such matter at the rates provided under this subsection unless he files annually with the Postal Service a written request for permission to mail matter at such rates."

In accordance with the provisions of this statute, I hereby request permission to mail the publication named in Item 1 at the reduced postage rates presently authorized by 39 U. S. C. 3626.

(Signature and title of editor, publisher, business manager, or owner)

10. FOR COMPLETION BY NONPROFIT ORGANIZATIONS AUTHORIZED TO MAIL AT SPECIAL RATES *(Section 132.122, Postal Manual)*

(Check one)

The purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes

☒ Have not changed during preceding 12 months

☐ Have changed during preceding 12 months

(If changed, publisher must submit explanation of change with this statement.)

11. EXTENT AND NATURE OF CIRCULATION	AVERAGE NO. COPIES EACH ISSUE DURING PRECEDING 12 MONTHS	ACTUAL NUMBER OF COPIES OF SINGLE ISSUE PUBLISHED NEAREST TO FILING DATE
A. TOTAL NO. COPIES PRINTED *(Net Press Run)*	4339	3400
B. PAID CIRCULATION 1. SALES THROUGH DEALERS AND CARRIERS, STREET VENDORS AND COUNTER SALES	NONE	NONE
2. MAIL SUBSCRIPTIONS	3006	2546
C. TOTAL PAID CIRCULATION	3006	2546
D. FREE DISTRIBUTION BY MAIL, CARRIER OR OTHER MEANS 1. SAMPLES, COMPLIMENTARY, AND OTHER FREE COPIES	NONE	NONE
2. COPIES DISTRIBUTED TO NEWS AGENTS, BUT NOT SOLD	NONE	NONE
E. TOTAL DISTRIBUTION *(Sum of C and D)*	3006	2546
F. OFFICE USE, LEFT-OVER, UNACCOUNTED, SPOILED AFTER PRINTING	1333	854
G. TOTAL *(Sum of E & F—should equal net press run shown in A)*	4339	3400

(Signature of editor, publisher, business manager, or owner)

I certify that the statements made by me above are correct and complete. William L. Murdock Exec. Secretary

PS Form 3526 July 1971

Annual Review of Entomology

Volume 18

Editors:

R. F. Smith

T. E. Mittler

C. N. Smith

•

Editorial Committee:

G. E. Guyer

B. Hocking

T. E. Mittler

P. W. Oman

A. G. Richards

C. N. Smith

R. F. Smith

C. F. Wilkinson

Volume 18 of this internationally known series will be published in January 1973. Volumes 1 through 17 also are available. Price $10.00 per copy in North America and U. S. Possessions, $10.50 elsewhere.

TABLE OF CONTENTS

John Ray: Indefatigible Student of Nature ..... *Clarence E. Mickel*

Biology, Control, and Eradication of the Boll Weevil ..... *William H. Cross*

Bionomics of the Northern and Western Corn Rootworms ..... *H. C. Chiang*

Bionomics of the Apple-Feeding Tortricidae ..... *P. J. Chapman*

Variability in Tetranychid Mites .... *W. Helle and W. P. J. Overmeer*

Coffee Insects ..... *R. H. Le Pelley*

The Fine Structure of Membranes and Intercellular Communication in Insects ..... *Peter Satir and Norton B. Gilula*

Protein Synthesis and Insect Morphogenesis ..... *Joseph Ilan and Judith Ilan*

Trophic Relations of Aquatic Insects ..... *Kenneth W. Cummins*

Changing Trends in Insect Pollination of Commercial Crops ..... *E. C. Martin and S. E. McGregor*

Numerical Taxonomy .. *W. Wayne Hendrickson, Jr. and John A. Moss*

Economic Thresholds ..... *Vernon M. Stern*

Recent Developments in Control of Blackflies ..... *Hugo Jamnback*

Ecology of the True Spiders (Araneomorphae) ..... *A. L. Turnbull*

Behavioral Responses to Insect Pheromones ..... *H. H. Shorey*

Insect Nutrition: Current Developments and Metabolic Implications ..... *R. H. Dadd*

Fate of Polar Bodies in Insects ..... *E. Tremblay and L. E. Caltagirone*

Neuro-Hormonal Control of Sexual Behavior in Insects ..... *Robert H. Barth and Larry J. Lester*

ENTOMOLOGICAL SOCIETY OF AMERICA
4603 Calvert Road, College Park, Maryland 20740